

**WATER TEMPERATURE DATA  
COLLECTED IN STREAMS OF THE SALMON RIVER DRAINAGE  
DURING THE SUMMERS OF 1994 & 1995**

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## **ABSTRACT**

In 1994, members of the Technical Committee of the Idaho Soil Conservation Commission, Model Watershed Project installed thermographs to measure summer water temperatures at 130 locations in the Salmon River Drainage, Idaho. In 1995, summer water temperatures were measured at 164 locations. Of the locations sampled in 1994, 73 (56.2%) had water temperatures greater than 60°F for substantial periods of time and 45 (34.6) had temperatures greater than 64°F. Of those locations sampled in 1995, 53 (32.3%) had temperatures exceeding 60°F for substantial periods and 20 (12.2%) had temperatures exceeding 64°F.

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## INTRODUCTION

The Technical Committee of the Idaho Soil Conservation Commission, Model Watershed Project (SCC) is made up of fishery professionals of several agencies with interest in the fisheries and fish habitat in the Salmon River drainage, including the Idaho Department of Fish and Game (IDFG); Shoshone-Bannock Indian Tribes (Sho Ban); Sawtooth National Recreation Area (SNRA), Salmon and Challis National Forests (USFS); and Salmon and Challis Districts of the Bureau of Land Management (BLM). Two events caused the committee to recognize the need for a baseline water temperature database: (1) the 1992 Federal listing of the Columbia Basin chinook salmon, *Oncorhynchus tshawytscha*, as a threatened species and (2) the 1994 publication of the Decision Notice, Environmental Assessment for the Interim Strategies for Managing Anadromous Fish-producing Watersheds in Eastern Oregon and Washington, Idaho, and Portions of California (popularly called 'PACFISH standards'). Coordinating sampling efforts and sharing data within the committee maximized the temperature data available to each agency for management decisions.

To date, summer water temperatures have been collected in the Salmon River drainage from 1993 through 1996. Before 1993 there was little water temperature data available. The Technical Committee began coordinating data collection in 1994.

## STUDY AREA

The study area encompassed the Salmon River drainage upstream of the confluence of Corn Creek with the Salmon River, Idaho. A total of 184 sites were sampled in all during 1994 and 1995. Many of the sites sampled in 1994 were sampled again in 1995.

## OBJECTIVES

The objectives of this report are to summarize water temperature data collected during the summers of 1994 and 1995 and to make those summaries available to researchers and resource managers.

## METHODS

Within the study area, individual members of the Technical Committee selected their own sample sites based on the needs and capabilities of their individual agencies. A HOBO-TEMP™ Miniature Data Logger (HOBO) manufactured by Onset Corporation was deployed at each site.

HOBOs are small electronic thermographs weighing only one ounce. They can store up to 1800 data points for a maximum log time of 360 days. Using the BoxCar™ Software available from the HOBO manufacturer, data is offloaded to a computer as an ASCII text file and made available for processing in spreadsheet or database programs.

HOBOs were launched (that is preprogrammed and standardized) using BoxCar™ Software. Generally, they were set out in late spring or early summer when water levels and road conditions allowed access to sample sites. The HOBOs were submerged and anchored to prevent both floating and washing away. The thermographs were retrieved in the fall before snowfall and road conditions prevented access to the sample site.

At my request, Technical Committee members made available to me copies of the data they collected during the summers of 1994 and 1995. A seasonal fisheries technician processed the data from each site in a Lotus 1-2-3 for Windows, Release 5 spreadsheet. She calculated the minimum, maximum and mean temperatures measured at each sample site (Appendices A and B.) The technician edited some samples when data indicated that the thermograph had been out of water during a portion of the sample period. Any samples with maximum temperatures greater than 60°F. were also graphed (Appendices C and D.)

## RESULTS

The collecting agency; location (stream/site); drainage (or subdrainage); date deployed (start date); date retrieved (end date) and minimum, maximum and mean temperatures measured for each site during the summers of 1994 and 1995 are listed in Appendices A and B, respectively.

Several of the HOBOs broke loose from their anchors, or loosened enough that they were floating when found. Some had been set during high water periods, and when the water receded, were left out of water. A few of the thermographs were tampered with or stolen. Those sites where HOBOs were lost, or where they were out of water for a substantial period of time are marked. One worker reported difficulties in downloading data from the HOBOs; a majority of the temperature readings for each of his sites was discarded.

In 1994, 95 of the 130 sites (73%) had maximum temperatures exceeding 60°F. The graphs of the data from these locations are in Appendix C. Similarly, 97 out of 164 (59%) graphs for similar sites in 1995 are in Appendix D.

Of the locations sampled in 1994, 73 (56.2%) had water temperatures greater than 60° F. for substantial periods of time and 45 (34.6%) had temperatures greater than 64° F. Of those locations sampled in 1995, 53 (32.3%) had temperatures exceeding 60° F. for substantial periods and 20 (12.2 %) had temperatures exceeding 64° F.

## DISCUSSION

According to the United States Geological Survey, the 1994 water year was substantially drier than the 1995 water year (Brennan et al. 1994, 1995). The mean annual discharge in the Salmon River at Whitebird, Idaho for 1994 was about one-half that of the median of mean annual discharges for the period 1951-1980, while the mean annual discharge for 1995 was about equal to the 30-year median. At the Salmon, Idaho gauge, flows during the 1995 water year (October, 1994 through September, 1995) were more than double the flows in the preceding water year (Table 1).

Table 1. Water statistics for Salmon River at Salmon, Idaho during 1994 and 1995 water years (Brennan et al. 1994, 1995).

Water Year	Annual Total (ft <sup>3</sup> /s)	Annual Mean (ft <sup>3</sup> /s)	Annual Runoff (acre feet)
1994	373,752	1,024	741,300
1995	769,351	2,108	1,526,000

In 1994 a larger percentage of the sites sampled had water temperatures warmer than 60°F. The substantially lower water flows in 1994 (compared to 1995) probably caused warmer water temperatures.

## RECOMMENDATIONS

HOBO thermographs are relatively simple to use, but problems (some unexpected) arose in their deployment. Thermographs were generally set out during periods of high flow. It was difficult to anchor them in water deeper than two feet, especially when water temperatures were cold with snow melt. Often, anchor sites accessible in the spring, were left high and dry in summer as water flows decreased.

Committee members reported that one HOBO model had a weak clip that attached the thermograph to the anchor, and speculated that it caused the loss of some thermographs.

A method of anchoring the HOBO needs to be devised so that the thermographs remain underwater for the entire sampling period. Anchoring needs to be strong enough to prevent the HOBO from being washed away, heavy enough to keep the thermograph from floating or hydroplaning, discreet enough to lesson the chance of tampering, yet obvious enough that the HOBOs can be found and retrieved.

The temperatures reported in this paper were gathered by more than 12 people. Their HOBO thermographs were set on different occasions and calibrated to different thermometers. If data is to be subjected to more rigorous examination, HOBOs should be uniformly calibrated so that measurements may be compared between sample years and among sample locations.

## **ACKNOWLEDGMENTS**

I wish to thank everyone who helped to make this report possible. The Technical Committee of the Idaho Soil Conservation Commission, Model Watershed Project provided a means for coordinating data collection. Jeff Anderson, Joe Butsick, Tom Curet, Shanda Fallau, Scott Feldhausen, Dan Garcia, Leon Jadlowski, Tom Montoya, Mark Moulton, Bruce Smith and Cindy Weston provided data and reviewed the data tables.

## LITERATURE CITED

Brennan, T.S., M.L. Jones, I. O'Dell, A.K. Lehmann and A.M. Tungate. 1994. Water Resources Data, Idaho, Water Year 1994, Volume 2. Upper Columbia River Basin and Snake River Basin below King Hill. U.S. Geological Survey Water-Data Report ID-94-2. U.S. Department of Interior, Boise, Idaho.

Brennan, T.S., I. O'Dell, A.K. Lehmann and A.M. Tungate. 1995. Water Resources Data, Idaho, Water Year 1995, Volume 2. Upper Columbia River Basin and Snake River Basin below King Hill. U.S. Geological Survey Water-Data Report ID-95-2. U.S. Department of Interior, Boise, Idaho.



## **APPENDICES**



Appendix A. Multi-agency water temperature data for the Salmon River drainage, 1994.

Collecting Agency	Stream/Site	\$7 Watershed	Start Date	End Date	Min °F	Max °F	Mean °F
USFS	Camas Creek above Duck Creek	Camas Creek	5/25	10/13	35.7	71.5	53.1
USFS	Camas Creek above enclosure	Camas Creek	5/25	10/13	35.1	68.2	51.5
USFS	Silver Creek above beaver ponds	Camas Creek	5/25	10/13	38.3	73.9	56.2
USFS	Silver Creek West of Rabbit Foot Summit	Camas Creek	5/24	10/17	33.4	68.5	49.5
USFS	Yellowjacket Creek above Lake Creek	Camas Creek	5/26	10/12	36.8	64.2	50.7
USFS	Yellowjacket Creek above Shovel Creek	Camas Creek	6/13	10/12	33.9	60.4	47.9
USFS	Yellowjacket Creek above Tin Cup Mine	Camas Creek	5/26	10/12	36.0	64.4	50.9
SNRA	West Pass Creek above Road 063 bridge	E F Salmon R.	6/16	10/12	38.0	65.6	53.7
		Hat Creek	5/15	10/21 <sup>b</sup>	25.1	70.9	50.4
BLM	Little Hat Creek <sup>a</sup>						
USFS	Bear Valley Creek - lower	Lemhi River	5/3	10/25	33.1	57.6	45.0
USFS	Bear Valley Creek - upper	Lemhi River	5/3	10/25	34.0	50.9	41.3
USFS	Big Bear Creek	Lemhi River	4/18	10/26	37.1	52.9	44.2
USFS	Big Eightmile above USFS boundary	Lemhi River	4/18	10/19	31.7	61.0	45.9
USFS	Big Timber below Basin Creek	Lemhi River	4/25	10/12	32.0	68.2	49.3

<sup>a</sup> - HOBO apparently out of water for a portion of the sampling area.

<sup>b</sup> - date IDFG technician interpreted from HOBO data.

<sup>c</sup> - HOBO data indicates malfunction of meter.

Appendix A. Continued

Collecting Agency	Stream/Site	S7 Watershed	Start Date	End Date	Min °F	Max °F	Mean °F
USFS	Big Timber below Grove Creek	Lemhi River	5/25 <sup>b</sup>	10/12	36.3	59.3	48.1
USFS	Canyon Creek at USFS boundary	Lemhi River	4/18	10/21	32.5	63.5	49.5
USFS	East Fork Hayden Creek - lower	Lemhi River	5/3	10/25	32.8	54.2	44.3
USFS	East Fork Hayden Creek - upper	Lemhi River	5/3	10/25	32.2	55.9	42.3
USFS	Hawley Creek above USFS boundary	Lemhi River	4/18	10/20	32.5	63.8	47.3
USFS	Hayden Creek - lower	Lemhi River	5/3	10/25	32.8	58.7	45.6
USFS	Hayden Creek - upper	Lemhi River	5/3	10/25	32.2	58.1	44.7
USFS	Hayden Creek at USFS guard station	Lemhi River	5/3	10/25	38.8	68.2	51.9
USFS	Lemhi River above Hayden Creek	Lemhi River	5/3	10/24	42.5	64.7	51.9
USFS	Lemhi River above Mouth	Lemhi River	5/4	10/25	40.8	73.9	57.6
IDFG	Lemhi River near mouth	Lemhi River	7/27	9/6	52.5	73.5	62.5
USFS	Little Eightmile Creek <sup>c</sup>	Lemhi River	4/18	—	31.7	58.7	45.6
USFS	Middle Fork Little Timber Creek	Lemhi River	4/25	11/3	34.3	61.8	48.6
USFS	Mill Creek	Lemhi River	4/18	10/20	31.7	53.4	43.3
USFS	North Fork Little Timber Creek	Lemhi River	4/25	10/18	37.4	55.9	46.6
USFS	Pattee Creek below USFS boundary	Lemhi River	5/3	10/25	37.4	64.4	49.2
USFS	Reservoir Creek <sup>c</sup>	Lemhi River	—	—	—	—	—

<sup>a</sup> - HOBO apparently out of water for a portion of the sampling area.

<sup>b</sup> - date IDFG technician interpreted from HOBO data.

<sup>c</sup> - HOBO data indicates malfunction of meter.

Appendix A. Continued

Collecting Agency	Stream/Site	S7 Watershed	Start Date	End Date	Min °F	Max °F	Mean °F
USFS	Boulder Creek <sup>c</sup>	Lower Salmon R.	6/8	11/8	—	—	—
USFS	Colson Creek	Lower Salmon R.	6/2	11/8	32.8	61.0	49.8
USFS	Corn Creek	Lower Salmon R.	6/2	11/8	36.0	57.3	49.3
USFS	Indian Creek <sup>c</sup>	Lower Salmon R.	6/8	8/26 <sup>b</sup>	42.8	60.9	52.8
USFS	Owl Creek	Lower Salmon R.	6/2	11/8	32.2	67.3	52.7
USFS	Pine Creek	Lower Salmon R.	6/8	11/8	31.7	62.7	50.4
USFS	Salmon River above Corn Creek <sup>c</sup>	Lower Salmon R.	7/11	11/8	38.2	73.8	61.6
USFS	Salmon River at Newland Ranch Bridge	Lower Salmon R.	7/27	10/26	41.7	73.6	58.7
USFS	Spring Creek	Lower Salmon R.	3/31	11/8	31.7	64.4	48.5
USFS	Squaw Creek	Lower Salmon R.	3/31	10/26	36.3	55.9	46.8
USFS	Upper Horse Creek	Lower Salmon R.	6/15	10/20	33.9	65.7	50.6
10	Middle Fork Salmon River at Mouth	M. F. Salmon R.	8/4	10/27	38.3	70.9	56.3
	Knapp Creek above diversion	Marsh Creek	6/14	10/7	31.9	75.1	53.9
	Knapp Creek below diversion	Marsh Creek	6/14	10/7	32.2	73.8	54.0

<sup>a</sup> - HOBO apparently out of water for a portion of the sampling area.

<sup>b</sup> - date DFG technician interpreted from HOBO data.

<sup>c</sup> - HOBO data indicates malfunction of meter.

Appendix A. Continued

Collecting Agency	Stream/Site	S7 Watershed	Start Date	End Date	Min °F	Max °F	Mean °F
USFS	Marsh Creek above Knapp Creek	Marsh Creek	6/14	10/7	35.1	64.4	48.1
USFS	Marsh Creek below Knapp Creek	Marsh Creek	6/14	10/7	34.0	65.5	48.6
USFS	Marsh Creek - upper <sup>a</sup>	Marsh Creek	5/19	10/7	32.8	76.4	54.9
USFS	Marsh Creek near Capehorn Creek	Marsh Creek	5/19 <sup>b</sup>	10/7	65.6	49.8	49.9
BLM	Morgan Creek	Morgan Creek	5/13 <sup>b</sup>	10/19	38.8	80.1	57.3
USFS	Morgan Creek	Morgan Creek	5/31	10/6	28.7	76.0	53.7
USFS	West Fork Morgan Creek	Morgan Creek	5/31	10/6	38.0	64.2	52.7
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USFS	Dahlonega Creek	N. F. Salmon R.	6/1	10/26	34.3	65.0	51.6
USFS	Ditch Creek	N. F. Salmon R.	6/1	10/26	35.4	70.0	50.9
USFS	Hughes Creek	N. F. Salmon R.	6/1	10/26	34.5	63.8	50.2
USFS	Moose Creek	N. F. Salmon R.	6/1	10/26	32.2	55.6	45.2
USFS	North Fork Salmon River above mouth	N. F. Salmon R.	6/13	10/26	36.8	77.9	55.0
USFS	North Fork Salmon River above Moose Creek	N. F. Salmon R.	6/1	10/26	35.1	53.4	45.2
USFS	North Fork Salmon River at Crone Gulch	N. F. Salmon R.	6/1	10/26	33.1	61.5	48.6
USFS	Pierce Creek	N. F. Salmon R.	6/14	10/26	32.0	64.7	49.1

<sup>a</sup> - HOBO apparently out of water for a portion of the sampling area.

<sup>b</sup> - date DFG technician interpreted from HOBO data.

<sup>c</sup> - HOBO data indicates malfunction of meter.

Appendix A. Continued

Collecting Agency	Stream/Site	S7 Watershed	Start Date	End Date	Min °F	Max °F	Mean °F
USFS	Sheep Creek	N. F. Salmon R.	6/1	10/26	35.4	56.2	46.4
USFS	Threemile Creek	N. F. Salmon R.	6/13	10/26	35.1	64.9	50.3
USFS	Twin Creek	N. F. Salmon R.	6/1	10/26	34.5	52.5	44.6
USFS	West Fork of North Fork Salmon River <sup>c</sup>	N. F. Salmon R.	6/13	--	--	--	--
		Panther Creek	5/6	--	31.4	62.7	45.8
USFS	Arnett Creek <sup>c</sup>	Panther Creek	5/6	10/11	38.5	60.7	50.4
USFS	Beaver Creek	Panther Creek	5/6	10/11	40.0	65.0	51.6
USFS	Clear Creek	Panther Creek	5/6	10/12	36.5	57.6	46.9
USFS	Deep Creek	Panther Creek	5/6	10/2 <sup>b</sup>	37.4	61.0	48.5
USFS	Moccasin Creek <sup>c</sup>	Panther Creek	5/24	10/12	34.8	61.5	49.3
USFS	Moyer Creek	Panther Creek	5/24	10/12	35.7	61.8	49.6
USFS	Musgrove Creek	Panther Creek	5/6	10/29 <sup>b</sup>	31.4	68.2	45.9
USFS	Napias Creek above Arnett Creek <sup>c</sup>	Panther Creek	5/6	11/17	23.0	95.2	47.4
USFS	Napias Cr. between Phelan & Moccasin Crs. <sup>a</sup>	Panther Creek	5/6	10/12	36.8	65.9	51.2
USFS	Napias Creek near Mouth	Panther Creek	6/21	10/11	37.3	69.3	54.9
USFS	Panther Creek above Big Jureano	Panther Creek	5/6	10/11	35.4	71.8	52.2
	Panther Creek above Deep Creek						

<sup>a</sup> - HOBO apparently out of water for a portion of the sampling area.

<sup>b</sup> - date DFG technician interpreted from HOBO data.

<sup>c</sup> - HOBO data indicates malfunction of meter.

Appendix A. Continued

Collecting Agency	Stream/Site	S7 Watershed	Start Date	End Date	Min °F	Max °F	Mean °F
USFS	Panther Creek above Napias Creek	Panther Creek	5/6	10/11	35.7	70.6	51.5
USFS	Panther Creek above Porphyra Creek	Panther Creek	6/13	10/14	29.8	67.8	51.9
USFS	Panther Creek at Fritzer Gulch	Panther Creek	5/6	10/11	38.8	68.5	54.4
USFS	Panther Creek at Rabbit Foot Summit Road <sup>c</sup>	Panther Creek	5/24	10/13	--	--	--
USFS	Panther Creek near mouth <sup>c</sup>	Panther Creek	5/6	--	--	--	--
USFS	Phelan Creek	Panther Creek	5/6	10/12	34.0	68.8	50.1
USFS	Porphyry Creek	Panther Creek	5/24	10/12	33.4	59.6	47.5
USFS	Woodstick Creek above mouth	Panther Creek	5/6	10/11	27.8	57.5	45.4
SNRA	Alders Lake Creek below Cabin Cr. Rd. bridge	Upper Salmon R.	6/14	10/11	33.7	78.2	57.6
USFS	Allison Creek	Upper Salmon R.	5/9	10/11	40.0	58.1	50.2
USFS	Basin Creek - lower	Upper Salmon R.	5/19	10/7	34.5	70.9	52.0
USFS	Basin Creek - upper	Upper Salmon R.	5/19	10/7	29.9	65.3	46.9
BLM	Bayhorse Creek	Upper Salmon R.	5/12	8/10	38.9	63.2	51.6
USFS	Big Hat Creek	Upper Salmon R.	6/28	10/20	33.1	65.6	49.3
USFS	Carmen Creek	Upper Salmon R.	8/3	11/9	31.4	57.9	45.3
USFS	Cow Creek	Upper Salmon R.	5/9	10/11	36.5	61.0	49.3

<sup>a</sup> - HOBO apparently out of water for a portion of the sampling area.

<sup>b</sup> - date IDFG technician interpreted from HOBO data.

<sup>c</sup> - HOBO data indicates malfunction of meter.

Appendix A. Continued

Collecting Agency	Stream/Site	S7 Watershed	Start Date	End Date	Min °F	Max °F	Mean °F
BLM	Cow Creek	Upper Salmon R.	5/16	10/21	36.8	60.1	48.3
USFS	Fourth of July Creek	Upper Salmon R.	6/30	11/9	34.3	66.2	52.9
SNRA	Fourth of July Creek above FJC1 diversion	Upper Salmon R.	6/14	10/11	31.7	72.1	50.2
USFS	Iron Creek - upper	Upper Salmon R.	5/4	10/25	32.8	54.8	44.4
USFS	Joe's Gulch - lower	Upper Salmon R.	5/19	10/7	35.7	67.0	50.0
USFS	Joe's Gulch - upper	Upper Salmon R.	5/18	10/7	38.5	72.3	38.5
USFS	Lake Creek - upper	Upper Salmon R.	5/4	10/27	35.1	56.2	47.1
USFS	McKim Creek	Upper Salmon R.	5/10	10/25	37.1	59.8	48.4
USFS	Middle Fork Hat Creek in meadow	Upper Salmon R.	6/28	10/27	33.7	61.3	46.4
14	North Fork Iron Creek - lower	Upper Salmon R.	5/4	10/25	34.5	60.1	46.6
USFS	North Fork Iron Creek - upper	Upper Salmon R.	5/4	10/25	32.2	54.5	43.8
USFS	North Fork McKim Creek	Upper Salmon R.	5/9	10/25	32.5	54.0	43.4
SNRA	Salmon River above Highway 75	Upper Salmon R.	6/13	10/12	31.7	68.2	50.0
USFS	Salmon River above Lemhi River	Upper Salmon R.	5/4	10/25	42.5	72.1	59.6
IDFG	Salmon River at Challis	Upper Salmon R.	7/13	9/3	53.9	76.3	63.9
IDFG	Salmon River at Clayton	Upper Salmon R.	7/13	9/10	48.6	75.1	61.6
IDFG	Salmon River at Salmon	Upper Salmon R.	7/27	9/10	55.3	75.1	64.7

a - HOBO apparently out of water for a portion of the sampling area.

b - date IDFG technician interpreted from HOBO data.

c - HOBO data indicates malfunction of meter.

Appendix A. Continued

Collecting Agency	Stream/Site	S7 Watershed	Start Date	End Date	Min °F	Max °F	Mean °F
IDFG	Salmon River at Sunbeam	Upper Salmon R.	7/13	9/10	50.0	73.5	61.6
USFS	Salmon River at USFS Yankee Fork Dist. Off.	Upper Salmon R.	5/19	10/8	40.8	72.3	57.0
SNRA	Smiley Creek at Road 077 bridge	Upper Salmon R.	6/13	10/12	32.2	70.0	52.5
USFS	South Fork Iron Creek	Upper Salmon R.	5/4	10/25	31.4	60.1	46.7
USFS	South Fork Williams Creek	Upper Salmon R.	5/4	10/27	32.5	57.6	46.4
BLM	Squaw Creek	Upper Salmon R.	5/13	10/19	34.1	75.3	52.7
USFS	Squaw Creek	Upper Salmon R.	5/19	10/8	34.3	69.7	52.0
BLM	Thompson Creek	Upper Salmon R.	5/13	10/19	37.0	68.1	51.2
USFS	Thompson Creek	Upper Salmon R.	5/19	10/8	34.8	70.9	51.4
USFS	Twelvemile Creek	Upper Salmon R.	5/10	10/25	28.3	56.9	47.8
USFS	Wagonhammer Creek	Upper Salmon R.	6/13	11/9	31.9	61.2	48.4
USFS	Warm Spring Creek	Upper Salmon R.	5/4	10/25	49.5	76.7	64.1
USFS	Williams Creek	Upper Salmon R.	5/4	10/27	33.7	56.2	46.6
SNRA	Stanley Creek above Tennell <sup>a</sup>	Valley Creek	6/15	10/11	36.3	77.0	56.8
SNRA	Stanley Lake Creek near Highway 20 bridge	Valley Creek	6/15	10/11	34.5	76.0	55.7
Sho Ban	Valley Creek upstream of mouth	Valley Creek	6/22	11/3	29.6	77.6	53.3

<sup>a</sup> - HOBO apparently out of water for a portion of the sampling area.

<sup>b</sup> - date IDFG technician interpreted from HOBO data.

<sup>c</sup> - HOBO data indicates malfunction of meter.

Appendix A. Continued

Collecting Agency	Stream/Site	S7 Watershed	Start Date	End Date	Min °F	Max °F	Mean °F
Sho Ban	Valley Creek upstream of USGS gauge	Valley Creek	6/22	11/7	31.6	75.7	51.1
USFS	Eightmile Creek	Yankee Fork	5/19	10/5	32.8	62.1	46.3
USFS	West Fork Yankee Fork Salmon River	Yankee Fork	5/19	10/4	30.8	63.8	48.8
USFS	Yankee Fork Salmon R. near Pole Cr. Cmpg. <sup>a</sup>	Yankee Fork	5/18	10/8	31.4	—	—
USFS	Yankee Fork Salmon River - upper	Yankee Fork	5/19	10/6	33.4	63.8	45.9

<sup>a</sup> - HOBO apparently out of water for a portion of the sampling area.

<sup>b</sup> - date IDFG technician interpreted from HOBO data.

<sup>c</sup> - HOBO data indicates malfunction of meter.



Appendix B. Multi-agency water temperature data for the Salmon River drainage, 1995.

Collecting Agency	Stream/Site	Watershed	Start Date	End Date	Min °F	Max °F	Mean °F
USFS	Camas Creek above Duck Creek <sup>a</sup>	Camas Creek	6/27	--	--	--	--
USFS	Camas Creek above enclosure <sup>a</sup>	Camas Creek	6/27	--	--	--	--
USFS	Silver Creek above beaver ponds	Camas Creek	6/27	11/9	31.7	61.0	46.9
USFS	Silver Creek below Lost Spring Campground	Camas Creek	6/27	11/9	31.6	69.0	50.9
USFS	Silver Creek west of Rabbit Foot Summit <sup>a</sup>	Camas Creek	--	--	--	--	--
USFS	Yellowjacket Creek above Lake Creek	Camas Creek	6/28	10/30	31.7	61.8	47.5
USFS	Yellowjacket Creek above Tin Cup Mine	Camas Creek	6/28	10/30	31.7	60.7	47.0
17	Bear Creek	E.F. Salmon R.	4/26	9/29	30.5	58.7	44.9
	Herd Creek - lower	E.F. Salmon R.	5/8	9/26	35.1	54.2	45.0
	Herd Creek above Lake Creek	E.F. Salmon R.	8/2	10/1	35.4	55.9	46.1
	Herd Creek at Monument Gulch	E.F. Salmon R.	8/2	10/11	36.3	59.9	48.5
	Herd Creek at lower Bennet's fence	E.F. Salmon R.	8/2	10/11	36.3	59.5	48.2
	Horse Basin Creek	E.F. Salmon R.	4/26	9/29	31.7	67.4	49.7
	Lake Creek below Herd Creek	E.F. Salmon R.	4/27	10/5	36.8	56.8	48.1
	Lake Creek near mouth	E.F. Salmon R.	7/31	10/5	36.5	65.5	52.2
	Little Boulder Creek	E.F. Salmon R.	6/8	9/6	35.1	58.1	47.6

<sup>a</sup> - HOBO meter not collected yet or lost.

<sup>b</sup> - date IDFG technician interpreted from HOBO data.

<sup>c</sup> - HOBO data indicates malfunction of meter.

<sup>d</sup> - HOBO apparently out of water for a portion of the sampling time.

Appendix B. Continued.

Collecting Agency	Stream/Site	Watershed	Start Date	End Date	Min °F	Max °F	Mean °F
BLM	Mosquito Creek	E.F. Salmon R.	5/22	9/29	30.2	56.4	44.1
BLM	Road Creek above Bear Creek	E.F. Salmon R.	4/26	9/29	34.0	62.7	49.6
BLM	Road Creek below Horse Basin Creek	E.F. Salmon R.	4/26	9/29	31.4	65.3	48.7
BLM	Road Creek below Mosquito Creek	E.F. Salmon R.	4/26	9/29	32.2	60.4	46.6
BLM	Little Hat Creek	Hat Creek	5/19	10/5	40.0	60.7	52.8
BLM	Agency Creek at BLM/USFS boundary	Lemhi River	7/18	9/27	36.3	58.7	50.1
BLM	Agency Creek near lower BLM boundary	Lemhi River	7/18	9/27	39.4	64.2	54.2
18	Basin Creek - Hayden Creek drainage	Lemhi River	7/24	9/27	36.8	67.0	53.2
USFS	Big Bear Creek	Lemhi River	5/4	11/27 <sup>b</sup>	35.1	55.9	43.5
USFS	Big Eightmile Creek	Lemhi River	5/4 <sup>b</sup>	11/27 <sup>b</sup>	31.4	53.7	40.6
BLM	Big Eightmile Creek above Lee Creek road	Lemhi River	7/25	9/27	37.7	62.4	50.6
SCC	Big Springs Creek near old Fish & Game weir	Lemhi River	5/2	10/30	36.5	65.0	49.3
USFS	Big Timber Creek below Grove Creek	Lemhi River	5/23 <sup>b</sup>	11/27 <sup>b</sup>	32.0	56.8	41.7
USFS	Canyon Creek	Lemhi River	5/4	10/27 <sup>b</sup>	32.0	60.7	46.0
BLM	Canyon Creek near lower BLM boundary	Lemhi River	4/13	9/27	32.0	60.7	48.7

a - HOBO meter not collected yet or lost.

b - date IDFG technician interpreted from HOBO data.

c - HOBO data indicates malfunction of meter.

d - HOBO apparently out of water for a portion of the sampling time.

Appendix B. Continued.

Collecting Agency	Stream/Site	Watershed	Start Date	End Date	Min °F	Max °F	Mean °F
USFS	East Fork Hayden Creek - upper	Lemhi River	5/23 <sup>b</sup>	11/28	32.8	50.3	39.2
BLM	Eighteenmile Creek below WSA boundary	Lemhi River	7/25	9/22	40.8	58.1	48.3
BLM	Geertson Creek below mouth of canyon	Lemhi River	7/25	9/29	37.7	52.9	46.5
USFS	Hawley Creek	Lemhi River	5/4	11/27 <sup>b</sup>	32.0	60.7	45.1
BLM	Hayden Creek at BLM/USFS boundary	Lemhi River	4/13	9/27	31.4	54.0	42.3
BLM	Haynes Creek	Lemhi River	7/24	9/27	38.5	61.9	51.3
BLM	Kenney Creek above BLM/private boundary	Lemhi River	7/18	9/29	43.9	53.4	47.1
BLM	Kenney Creek in canyon	Lemhi River	7/25	10/11	61.0	82.1	69.7
IDFG	Lemhi River	Lemhi River	6/23	7/28	49.7	66.7	58.0
SCC	Lemhi River above Cottom Lane bridge	Lemhi River	5/2	10/29	35.4	66.4	50.5
SCC	Lemhi River below L59 diversion	Lemhi River	5/2	10/30	36.5	63.5	48.7
USFS	Little Eightmile Creek <sup>d</sup>	Lemhi River	--	--	--	--	--
BLM	McDevitt Creek near old cabins	Lemhi River	7/24	9/27	43.9	60.4	53.7
USFS	Middle Fork Little Timber Creek	Lemhi River	5/23 <sup>b</sup>	11/27 <sup>b</sup>	32.0	60.7	44.2
USFS	Mill Creek	Lemhi River	5/4 <sup>b</sup>	11/27 <sup>b</sup>	31.7	50.9	39.7
BLM	Mill Creek near BLM/private boundary	Lemhi River	7/25	9/28	40.3	52.0	46.8
USFS	North Fork Little Timber Creek	Lemhi River	5/15 <sup>b</sup>	11/22 <sup>b</sup>	35.7	53.4	43.6

a - HOBO meter not collected yet or lost.

b - date IDFG technician interpreted from HOBO data.

c - HOBO data indicates malfunction of meter.

d - HOBO apparently out of water for a portion of the sampling time.

Appendix B. Continued.

Collecting Agency	Stream/Site	Watershed	Start Date	End Date	Min °F	Max °F	Mean °F
USFS	Pattee Creek	Lemhi River	5/22	11/28	32.0	62.7	46.6
BLM	Pattee Creek below HIP fence	Lemhi River	7/18	9/28	43.6	61.5	52.9
USFS	Reservoir Creek	Lemhi River	5/4	11/27 <sup>b</sup>	33.1	61.8	44.5
BLM	Swan Basin Creek - tributary of Timber Creek	Lemhi River	7/25	12/8	31.7	63.2	42.6
BLM	Timber Creek one mile upstream of Hwy. 28	Lemhi River	7/26	9/27	35.7	63.0	51.5
BLM	Yearian Creek above lower road crossing	Lemhi River	7/20	9/27	37.4	63.0	53.0
20	Summit Creek	Little Lost River	5/15	10/4	35.7	7.06	53.5
	Boulder Creek	Lower Salmon R.	4/19	11/6	31.7	61.5	46.9
	Colson Creek	Lower Salmon R.	4/18	11/9	32.8	57.3	47.0
	Corn Creek	Lower Salmon R.	4/18	11/6	33.7	55.9	46.3
	East Boulder Creek above bridge	Lower Salmon R.	7/29	10/7	31.6	62.9	46.2
	Indian Creek	Lower Salmon R.	8/25	11/9	32.2	57.2	46.4
	Horse Creek - lower	Lower Salmon R.	3/4	10/3	31.9	64.9	47.8
	Moose Creek above bridge	Lower Salmon R.	7/27	10/17	34.0	60.4	47.5
	Owl Creek	Lower Salmon R.	4/18	11/6	31.7	65.0	49.1

<sup>a</sup> - HOBO meter not collected yet or lost.

<sup>b</sup> - date IDFG technician interpreted from HOBO data.

<sup>c</sup> - HOBO data indicates malfunction of meter.

<sup>d</sup> - HOBO apparently out of water for a portion of the sampling time.

Appendix B. Continued.

Collecting Agency	Stream/Site	Watershed	Start Date	End Date	Min °F	Max °F	Mean °F
USFS	Pine Creek	Lower Salmon R.	4/18	11/6	31.7	58.7	46.6
	Salmon River above Owl Creek	Lower Salmon R.	8/17	10/3	48.3	70.2	60.6
	Salmon River at Newland Ranch bridge	Lower Salmon R.	8/15	11/13	31.7	67.9	51.6
	Salmon River at Corn Creek	Lower Salmon R.	8/14	10/3	48.0	67.3	59.6
	Spring Creek	Lower Salmon R.	4/19	11/6	31.7	61.0	47.2
	Squaw Creek	Lower Salmon R.	4/19	11/6	32.0	53.7	45.3
	Upper Horse Creek above hot springs	Lower Salmon R.	7/7	10/6	32.2	51.7	42.8
	Upper Horse Creek below hot springs	Lower Salmon R.	7/7	10/6	33.9	63.4	50.1
	Middle Fork Salmon River at mouth <sup>a</sup>	M.F. Salmon R.	--	--	--	--	--
	Knapp Creek above lower diversion	Marsh Creek	7/26	9/21	37.7	64.4	51.8
USFS	Knapp Creek above top diversion	Marsh Creek	7/26	9/25	36.8	64.1	51.4
	Marsh Creek - upper	Marsh Creek	6/6	7/31	43.3	60.7	54.2
	Marsh Creek above Knapp Creek	Marsh Creek	7/26	9/21	37.1	61.5	48.8
	Marsh Creek below Knapp Creek	Marsh Creek	7/26	9/21	36.8	62.4	49.0

- <sup>a</sup> - HOBO meter not collected yet or lost.
- <sup>b</sup> - date IDFG technician interpreted from HOBO data.
- <sup>c</sup> - HOBO data indicates malfunction of meter.
- <sup>d</sup> - HOBO apparently out of water for a portion of the sampling time.

Appendix B. Continued.

Collecting Agency	Stream/Site	Watershed	Start Date	End Date	Min °F	Max °F	Mean °F
USFS	Corral Creek	Morgan Creek	5/16	9/27	34.0	62.0	47.2
USFS	Morgan Creek	Morgan Creek	5/16	9/23	36.8	67.0	52.0
BLM	Morgan Creek above W.F. Morgan Creek	Morgan Creek	6/23	10/5	36.7	69.3	54.8
BLM	Morgan Creek below BLM campsite	Morgan Creek	6/23	10/5	38.5	70.0	55.4
BLM	West Fork Morgan Creek	Morgan Creek	4/28	10/5	35.1	62.1	48.2
USFS	Dahlonega Creek	N.F. Salmon R.	5/10	11/3	32.0	62.1	48.0
USFS	Ditch Creek, lower	N.F. Salmon R.	8/25	11/13	31.6	58.7	43.3
22	Ditch Creek, upper	N.F. Salmon R.	5/10	11/3	31.6	50.8	41.6
	Hughes Creek	N.F. Salmon R.	4/19	11/3 <sup>b</sup>	32.0	60.4	45.5
USFS	Hull Creek	N.F. Salmon R.	4/19	11/3	34.5	51.7	42.9
USFS	Moose Creek	N.F. Salmon R.	7/27	10/17	34.0	60.4	47.5
USFS	North Fork Salmon River above Moose Creek	N.F. Salmon R.	8/25	11/13	31.6	50.0	39.7
USFS	North Fork Salmon River above mouth <sup>a</sup>	N.F. Salmon R.	4/19	--	--	--	--
USFS	North Fork Salmon River at Crone Gulch	N.F. Salmon R.	4/19	11/3	31.4	57.9	44.0
USFS	North Fork Salmon River at Hughes Creek	N.F. Salmon R.	8/2	11/13	31.6	62.7	46.0
USFS	Pierce Creek	N.F. Salmon R.	5/9	11/8	31.7	62.1	44.9

<sup>a</sup> - HOBO meter not collected yet or lost.

<sup>b</sup> - date DFG technician interpreted from HOBO data.

c - HOBO data indicates malfunction of meter.

d - HOBO apparently out of water for a portion of the sampling time.

Appendix B. Continued.

Collecting Agency	Stream/Site	Watershed	Start Date	End Date	Min °F	Max °F	Mean °F
USFS	Sheep Creek	N.F. Salmon R.	4/19	11/8	26.9	50.9	42.5
USFS	Threemile Creek	N.F. Salmon R.	5/10	11/3	32.2	60.6	46.4
USFS	Twin Creek	N.F. Salmon R.	5/9	11/3	31.7	50.6	41.9
USFS	West Fork of North Fork Salmon R. <sup>d</sup>	N.F. Salmon R.	5/9	11/3	31.7	51.4	41.9
BLM	Burnt Creek	Pahsimeroi R.	6/7	10/4	33.7	63.2	49.6
SCC	Pahsimeroi River below Downton Lane Bridge	Pahsimeroi R.	5/3	10/31	40.5	65.3	51.7
23		Panther Creek	4/21	10/26	31.6	59.2	42.8
USFS	Arnett Creek	Panther Creek	6/29	10/30	36.3	58.4	49.1
USFS	Beaver Creek	Panther Creek	6/28	10/30	31.4	66.2	48.0
USFS	Blackbird Creek	Panther Creek	7/25	10/30	35.7	59.6	48.6
USFS	Clear Creek	Panther Creek	6/29	10/25	33.4	55.3	45.8
USFS	Deep Creek	Panther Creek	—	—	—	—	—
USFS	Moccasin Creek <sup>a</sup>	Panther Creek	6/27	10/26	32.0	59.3	46.3
USFS	Moyer Creek	Panther Creek	6/27	10/26	33.7	58.7	47.7
USFS	Musgrove Creek	Panther Creek	—	—	—	—	—
USFS	Napias Creek above Arnett Creek <sup>d</sup>	Panther Creek	—	—	—	—	—

<sup>a</sup> - HOBO meter not collected yet or lost.

<sup>b</sup> - date IDFG technician interpreted from HOBO data.

<sup>c</sup> - HOBO data indicates malfunction of meter.

<sup>d</sup> - HOBO apparently out of water for a portion of the sampling time.

Appendix B. Continued.

Collecting Agency	Stream/Site	Watershed	Start Date	End Date	Min °F	Max °F	Mean °F
USFS	Napias Creek above mouth	Panther Creek	7/31	10/25	32.0	63.8	48.1
USFS	Napias Cr. between Phelan & Moccasin Crs.	Panther Creek	6/29	10/26	31.4	67.6	48.9
USFS	Panther Creek above Big Jureano Creek	Panther Creek	7/31	10/30	31.9	64.0	48.3
USFS	Panther Creek above Deep Creek	Panther Creek	6/28	10/30	31.4	64.4	48.8
USFS	Panther Creek above Napias Creek	Panther Creek	7/31	10/26	31.4	63.0	47.7
USFS	Panther Creek above Opal Creek	Panther Creek	6/27	10/26	32.5	56.5	44.7
USFS	Panther Creek above Porphyry Creek	Panther Creek	6/27	10/25	31.6	63.2	49.0
USFS	Panther Creek at Fritzer Gulch	Panther Creek	7/25	10/30	32.8	64.4	49.7
USFS	Panther Creek at Rabbit Foot Summit Road <sup>a</sup>	Panther Creek	—	—	—	—	—
USFS	Panther Creek near mouth <sup>a</sup>	Panther Creek	—	—	—	—	—
USFS	Phelan Creek	Panther Creek	6/29	10/26	32.0	65.3	48.3
USFS	Porphyry Creek	Panther Creek	7/31	10/26	32.2	57.2	44.4
USFS	Woodtick Creek above mouth	Panther Creek	6/28	10/26 <sup>b</sup>	33.9	51.9	43.7
USFS	Allison Creek	Upper Salmon R.	6/30	9/28	42.0	55.6	49.9
USFS	Basin Creek - lower	Upper Salmon R.	5/10	9/22	34.0	62.1	46.4
USFS	Basin Creek - upper	Upper Salmon R.	6/6	9/25	33.4	57.6	44.5

<sup>a</sup> - HOBO meter not collected yet or lost.

<sup>b</sup> - date IDFG technician interpreted from HOBO data.

c - HOBO data indicates malfunction of meter.

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Appendix B. Continued.

Collecting Agency	Stream/Site	Watershed	Start Date	End Date	Min °F	Max °F	Mean °F
USFS	Big Hat Creek	Upper Salmon R.	7/20 <sup>b</sup>	9/20	40.8	61.0	50.3
USFS	Carmen Creek - lower	Upper Salmon R.	8/2	12/5	32.2	63.8	47.7
USFS	Carmen Creek - upper	Upper Salmon R.	4/20	11/3	31.7	54.5	43.4
USFS	Challis Creek	Upper Salmon R.	5/17	9/23	41.3	64.7	51.5
USFS	Cow Creek <sup>a</sup>	Upper Salmon R.	--	--	--	--	--
USFS	Fourth of July Creek - lower	Upper Salmon R.	7/7	11/15	33.9	60.9	50.4
USFS	Fourth of July Creek - upper	Upper Salmon R.	4/20	11/3	31.9	55.3	42.8
USFS	Iron Creek - lower	Upper Salmon R.	5/9	10/20	35.3	55.5	45.4
USFS	Iron Creek - upper	Upper Salmon R.	5/9	10/20	33.4	52.0	42.8
USFS	Jesse Creek at gauge station	Upper Salmon R.	4/18	10/20	34.0	47.8	42.5
USFS	Joe's Gulch - lower	Upper Salmon R.	5/9	9/22	35.1	64.2	48.8
USFS	Joe's Gulch - upper	Upper Salmon R.	5/10	9/22	34.9	67.0	50.4
USFS	Lake Creek - upper	Upper Salmon R.	5/11	10/20	36.0	54.5	45.4
USFS	McKim Creek above Forest boundary <sup>a</sup>	Upper Salmon R.	--	--	--	--	--
USFS	Middle Fork Hat Creek in meadow	Upper Salmon R.	7/14	10/17	31.7	56.8	44.4
USFS	North Fork Iron Creek - lower	Upper Salmon R.	5/9	10/20	34.3	55.3	44.4
USFS	North Fork Iron Creek - upper	Upper Salmon R.	5/9	10/20	33.4	51.7	42.1

<sup>a</sup> - HOBO meter not collected yet or lost.

<sup>b</sup> - date IDFG technician interpreted from HOBO data.

<sup>c</sup> - HOBO data indicates malfunction of meter.

<sup>d</sup> - HOBO apparently out of water for a portion of the sampling time.

Appendix B. Continued.

Collecting Agency	Stream/Site	Watershed	Start Date	End Date	Min °F	Max °F	Mean °F
USFS	North Fork McKim Creek	Upper Salmon R.	6/30	9/28	36.8	50.0	44.1
SNRA	Salmon River above Highway 75 <sup>a</sup>	Upper Salmon R.	—	—	—	—	—
IDFG	Salmon River at Challis below Hwy. 93 bridge	Upper Salmon R.	6/22	9/19	48.0	64.7	57.1
USFS	Salmon River at USFS Yankee Fork Dist. Off.	Upper Salmon R.	5/5	9/23	36.0	69.4	52.3
IDFG	Salmon River below Clayton at bridge	Upper Salmon R.	6/22	9/19	46.4	70.2	56.5
IDFG	Salmon River below Yankee Fork	Upper Salmon R.	6/22	9/19	46.1	67.3	57.0
SNRA	Salmon River below Yankee Fork	Upper Salmon R.	8/1	10/26	35.7	65.0	51.3
USFS	Salmon River near Hwy. 75 milepost 241	Upper Salmon R.	5/10	9/23	40.2	65.0	53.6
SNRA	Salmon River near Torrey's Hole <sup>c</sup>	Upper Salmon R.	8/1	10/26	34.5	64.4	51.4
IDFG	Salmon River upstream of Lemhi River	Upper Salmon R.	6/23	9/21	50.3	70.5	61.1
USFS	South Fork Iron Creek <sup>a</sup>	Upper Salmon R.	—	—	—	—	—
USFS	South Fork Williams Creek <sup>c</sup>	Upper Salmon R.	5/11	10/19	29.6	64.4	45.9
USFS	Squaw Creek	Upper Salmon R.	5/10	9/23	33.4	65.0	47.3
BLM	Squaw Creek	Upper Salmon R.	6/23	10/3	36.7	68.2	51.7
USFS	Thompson Creek	Upper Salmon R.	5/9	9/23	35.7	62.7	48.5
BLM	Thompson Creek	Upper Salmon R.	6/23	10/3	36.3	63.9	49.2
USFS	Wagonhammer Creek <sup>d</sup>	Upper Salmon R.	3/29	11/7	—	—	—

<sup>a</sup> - HOBO meter not collected yet or lost.

<sup>b</sup> - date IDFG technician interpreted from HOBO data.

<sup>c</sup> - HOBO data indicates malfunction of meter.

<sup>d</sup> - HOBO apparently out of water for a portion of the sampling time.

Appendix B. Continued.

Collecting Agency	Stream/Site	Watershed	Start Date	End Date	Min °F	Max °F	Mean °F
USFS	Warm Spring Creek above mouth	Upper Salmon R.	5/11	10/20	39.4	72.0	58.1
USFS	Williams Creek above USFS boundary	Upper Salmon R.	5/11	10/19	35.4	54.8	45.7
Sho Ban	Valley Creek above Stanley Lake Creek	Valley Creek	--	--	--	--	--
Sho Ban	Valley Creek at mouth near USGS gage	Valley Creek	3/13	10/11	31.6	69.6	48.3
USFS	Yankee Fork Salmon River - upper	Yankee Fork	6/20	9/22	34.0	58.1	44.7
USFS	Yankee Fork Salmon R. near Pole Cr. Cmpg. <sup>c</sup>	Yankee Fork	5/9	9/22	33.1	95.2	47.6

<sup>a</sup> - HOBO meter not collected yet or lost.

<sup>b</sup> - date IDFG technician interpreted from HOBO data.

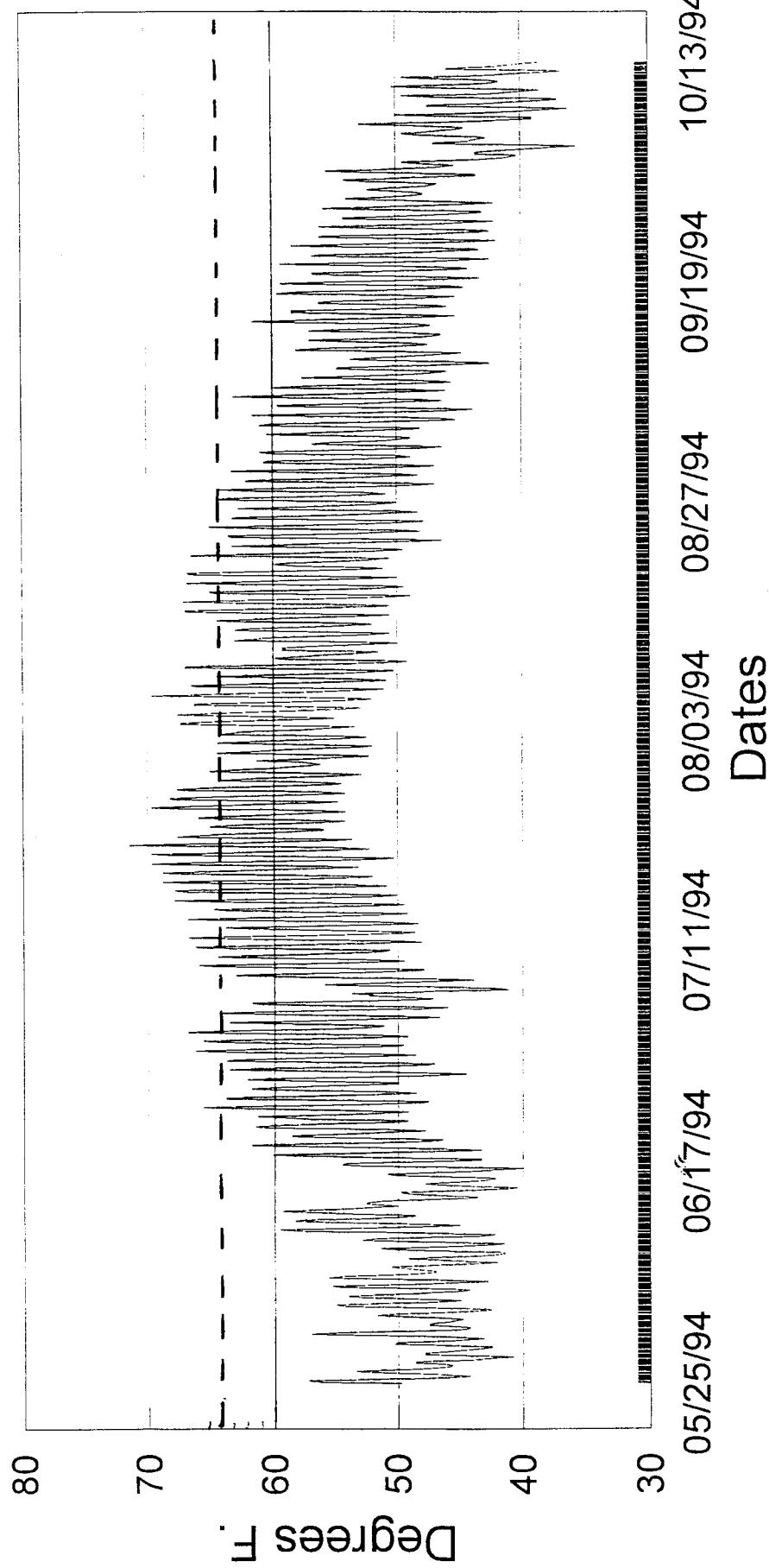
<sup>c</sup> - HOBO data indicates malfunction of meter.

<sup>d</sup> - HOBO apparently out of water for a portion of the sampling time.

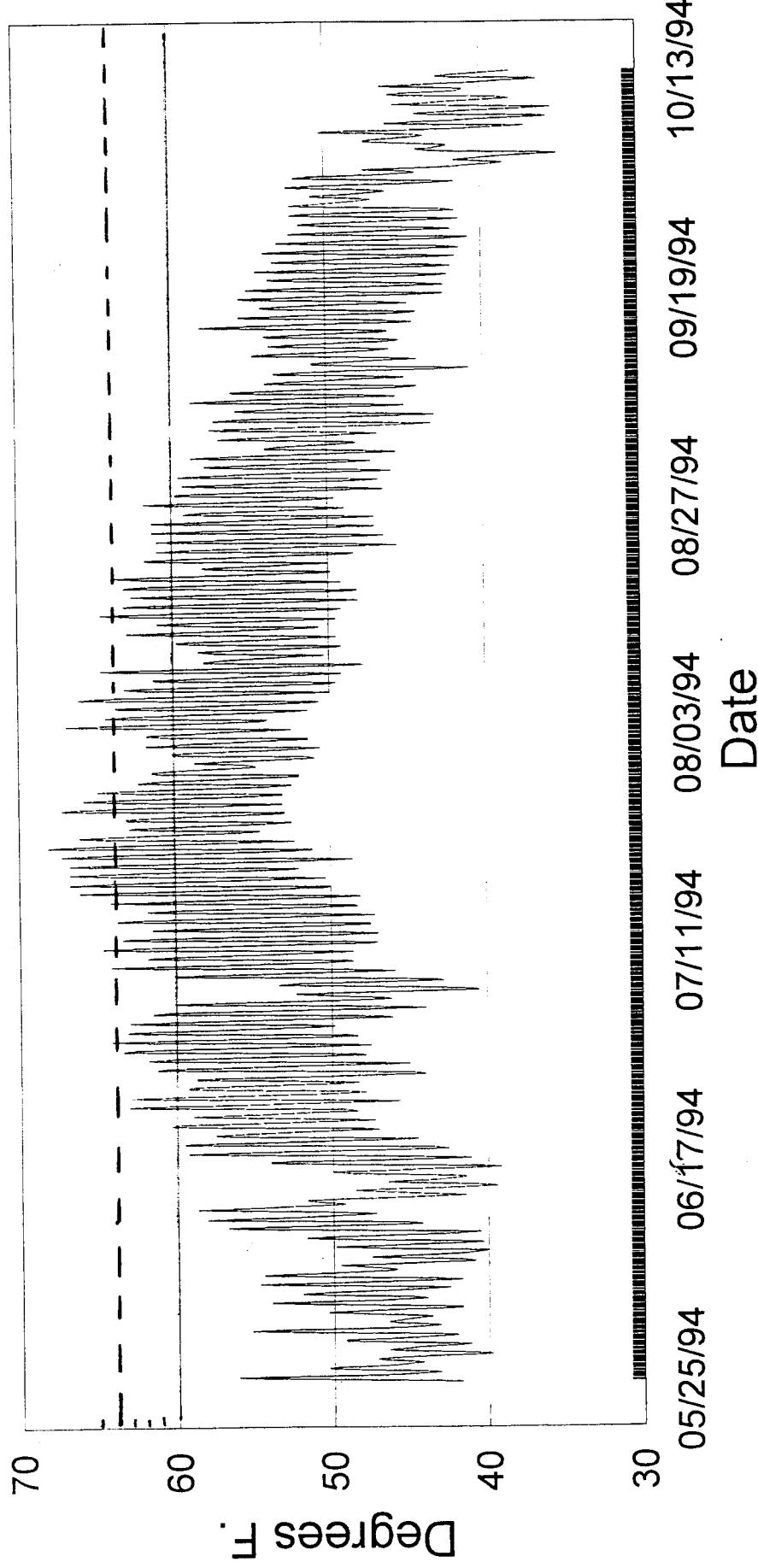


Appendix C. Sites sampled in 1994 with maximum temperatures exceeding 60°F.

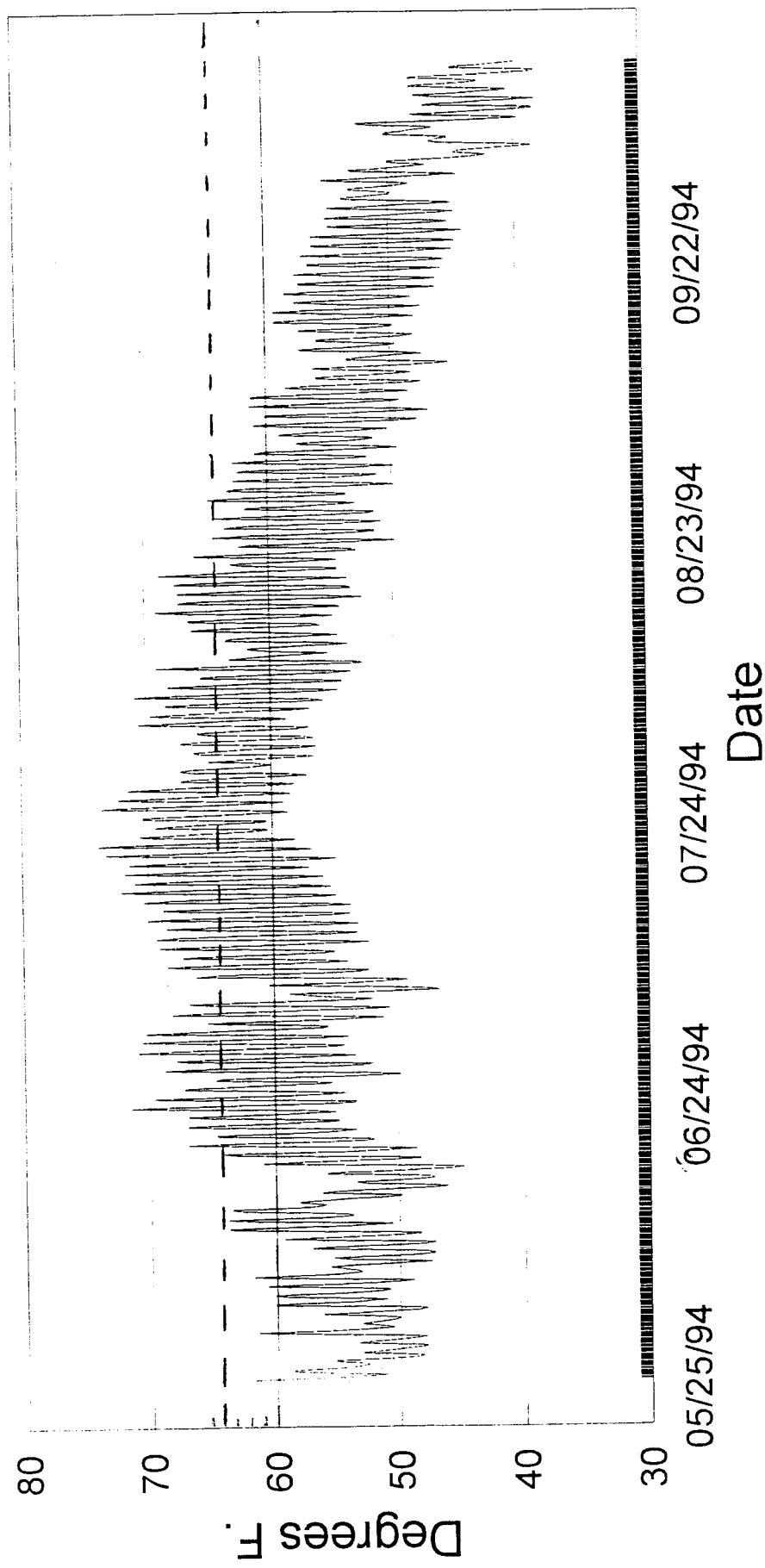
## Camas Creek above Duck Creek 1994 HOBO Temperatures



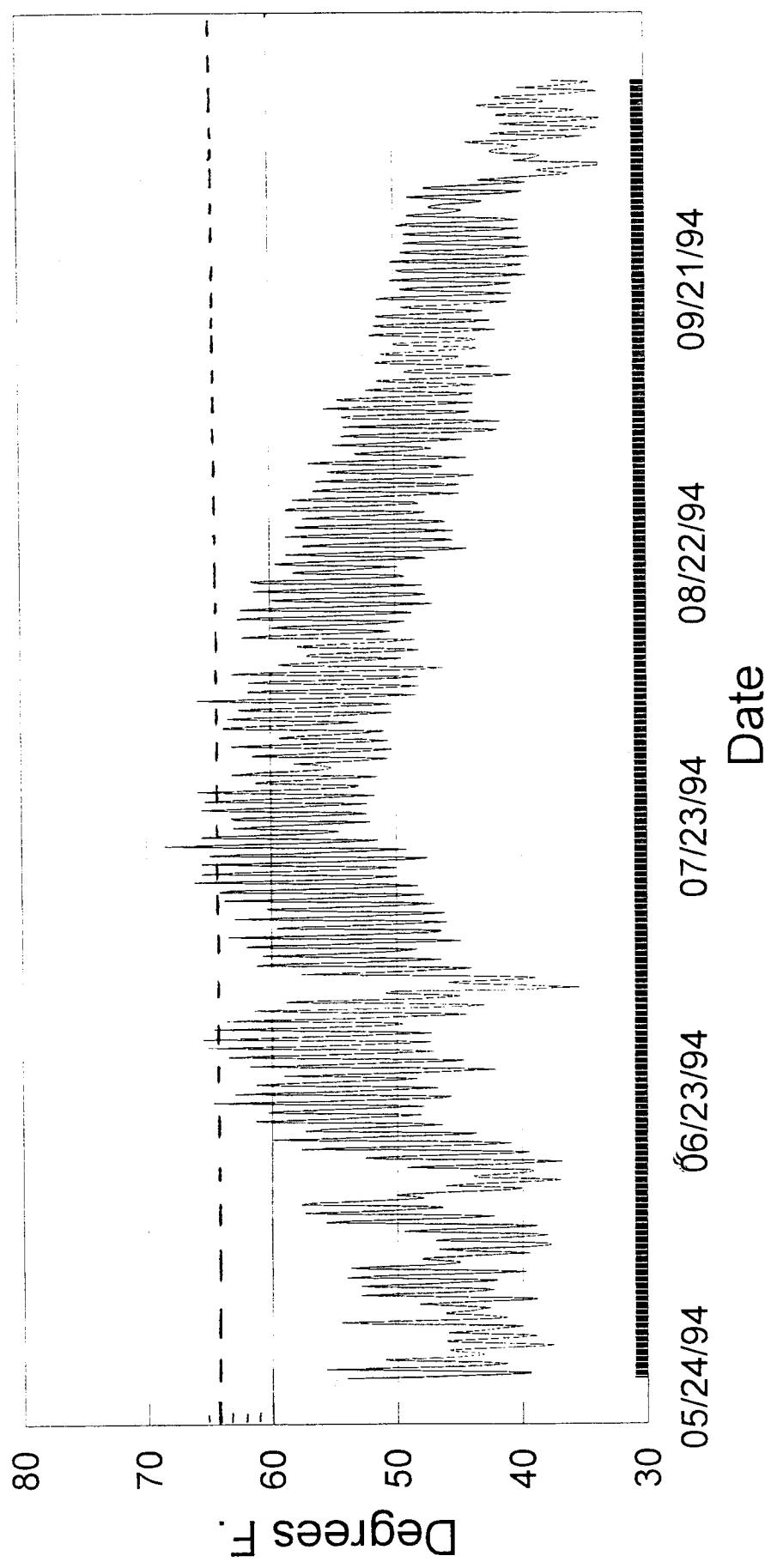
**Camas Creek above Exclosure  
1994 HOBO Temperatures**



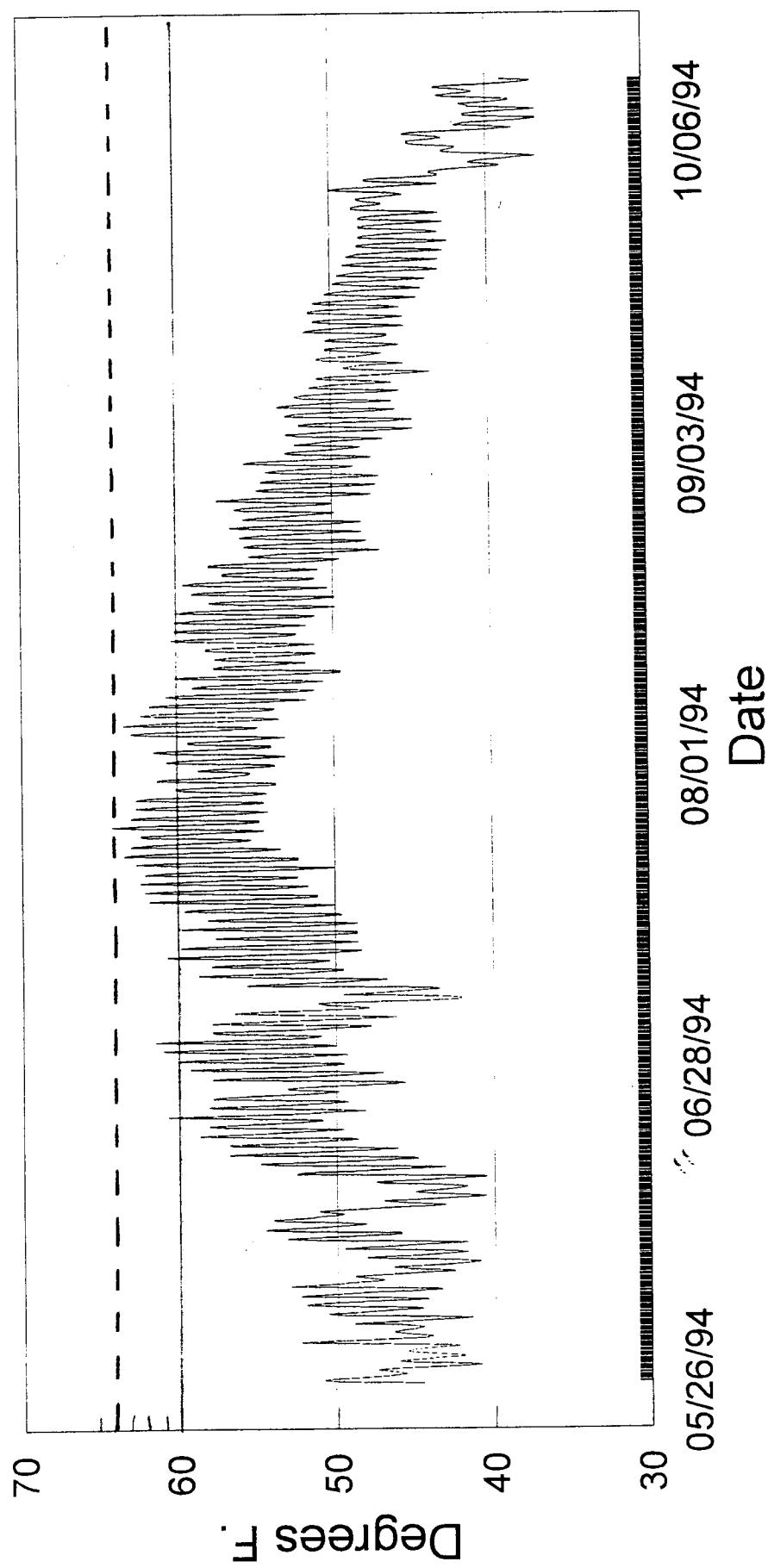
**Silver Creek above Beaver Ponds**  
**1994 HOBO Temperatures**



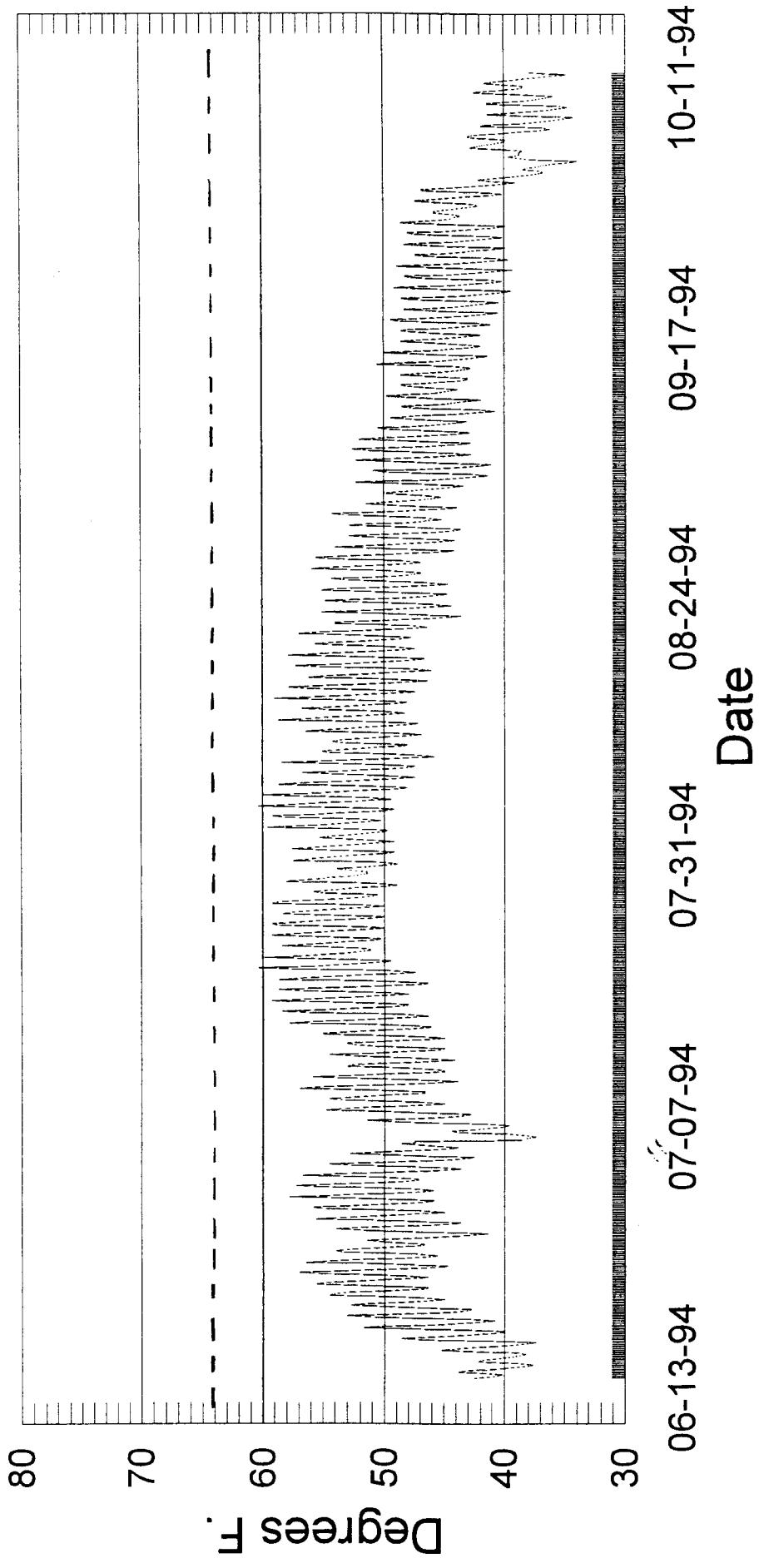
## Silver Creek West of Rabbit Foot Summit 1994 HOBO Temperatures



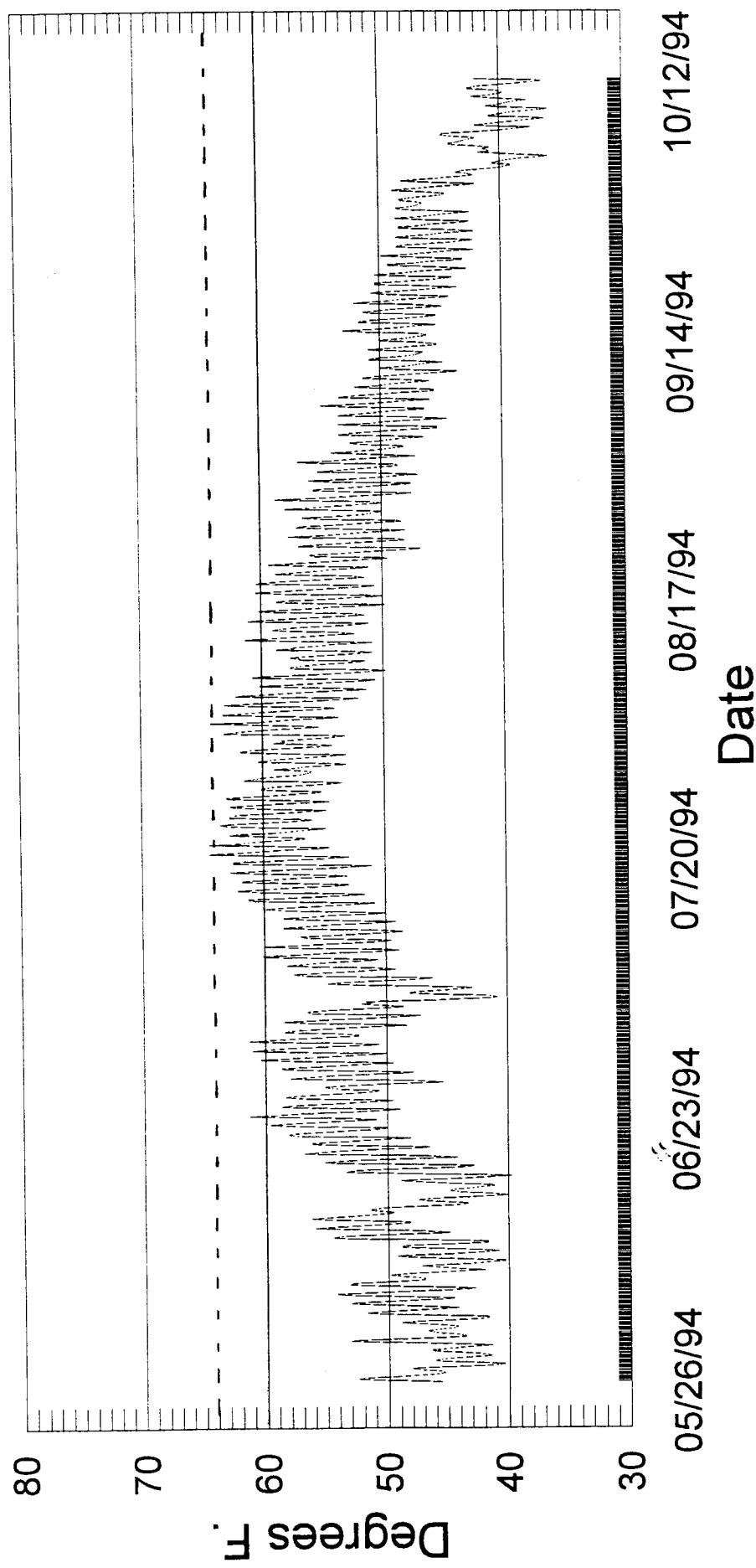
**Yellowjacket Creek above Lake Creek  
1994 HOBO Temperatures**



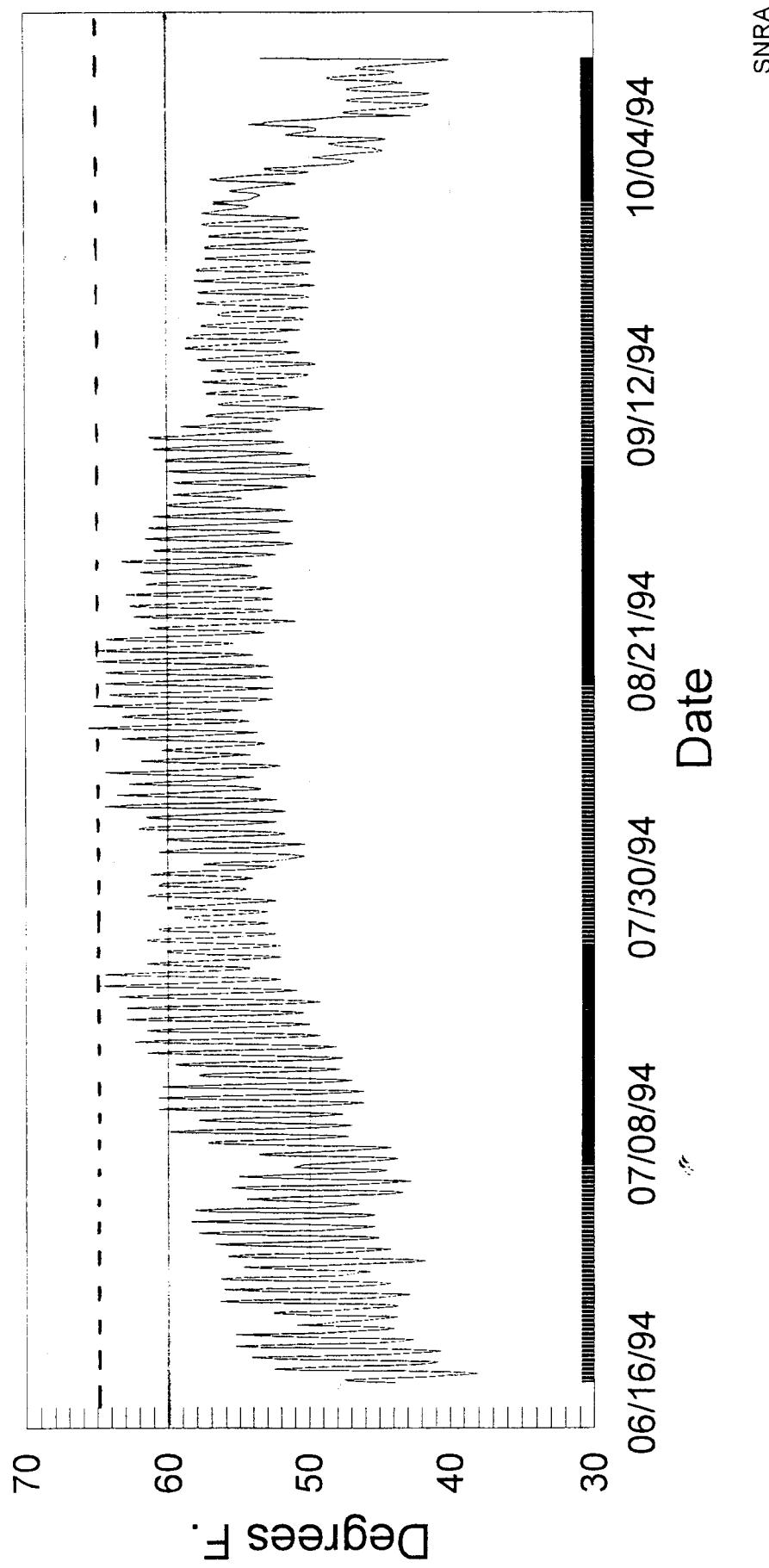
## Yellowjacket Creek above Shovel Creek 1994 HOBO Temperatures



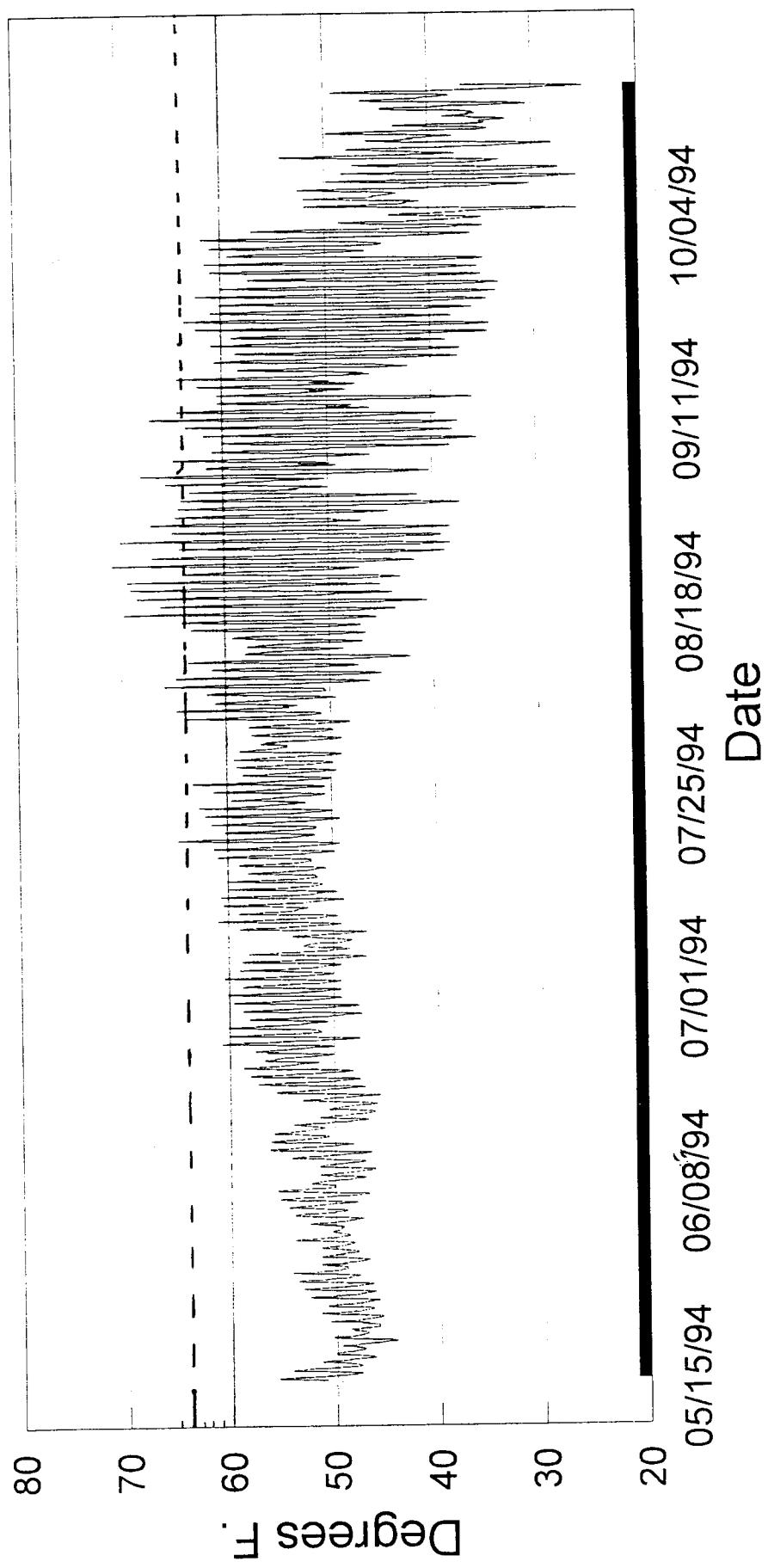
**Yellowjacket Creek above Tin Cup Mine  
1994 HOBO Temperatures**



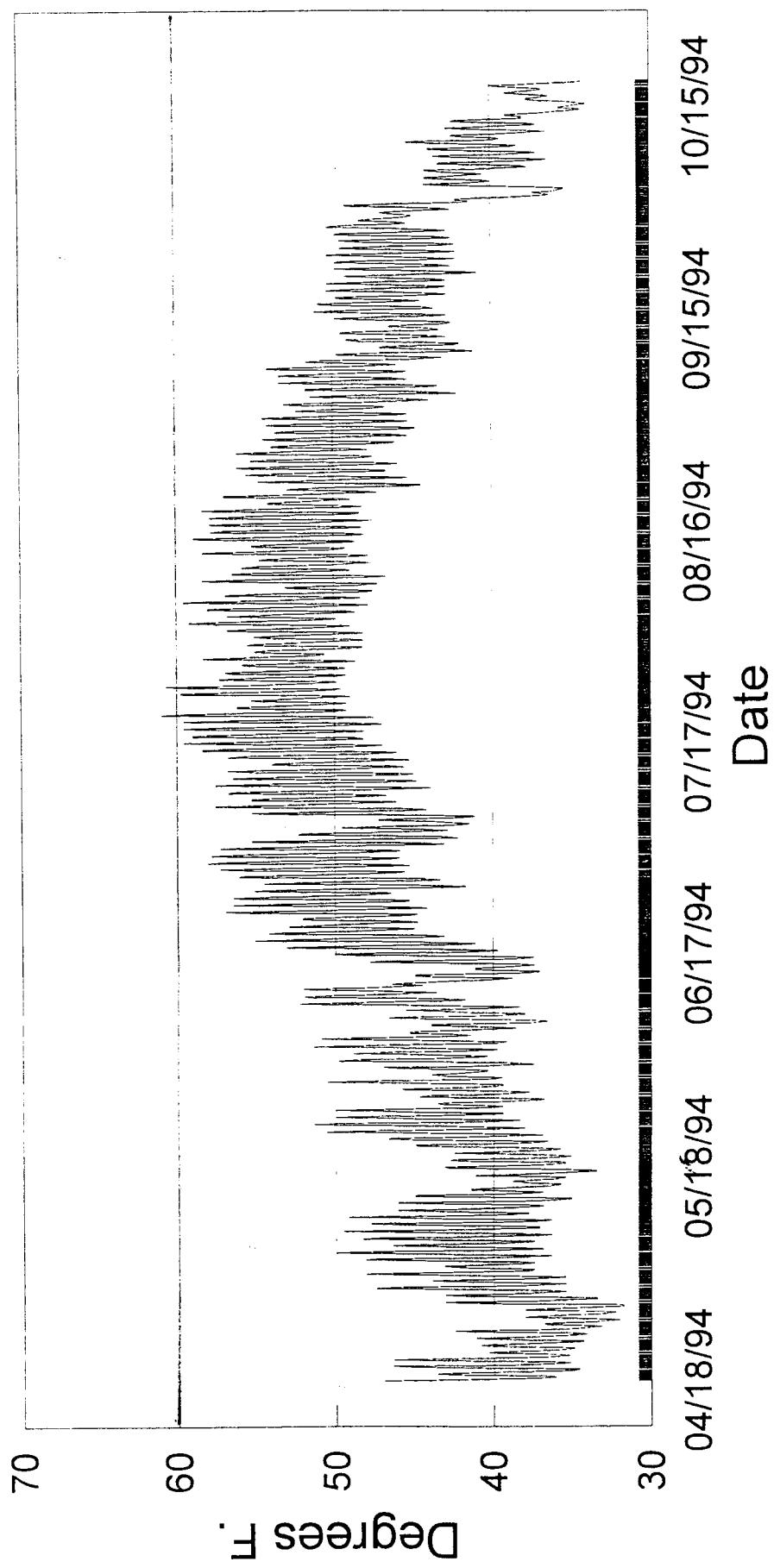
## West Pass Creek above the Bridge 1994 HOBO Temperatures



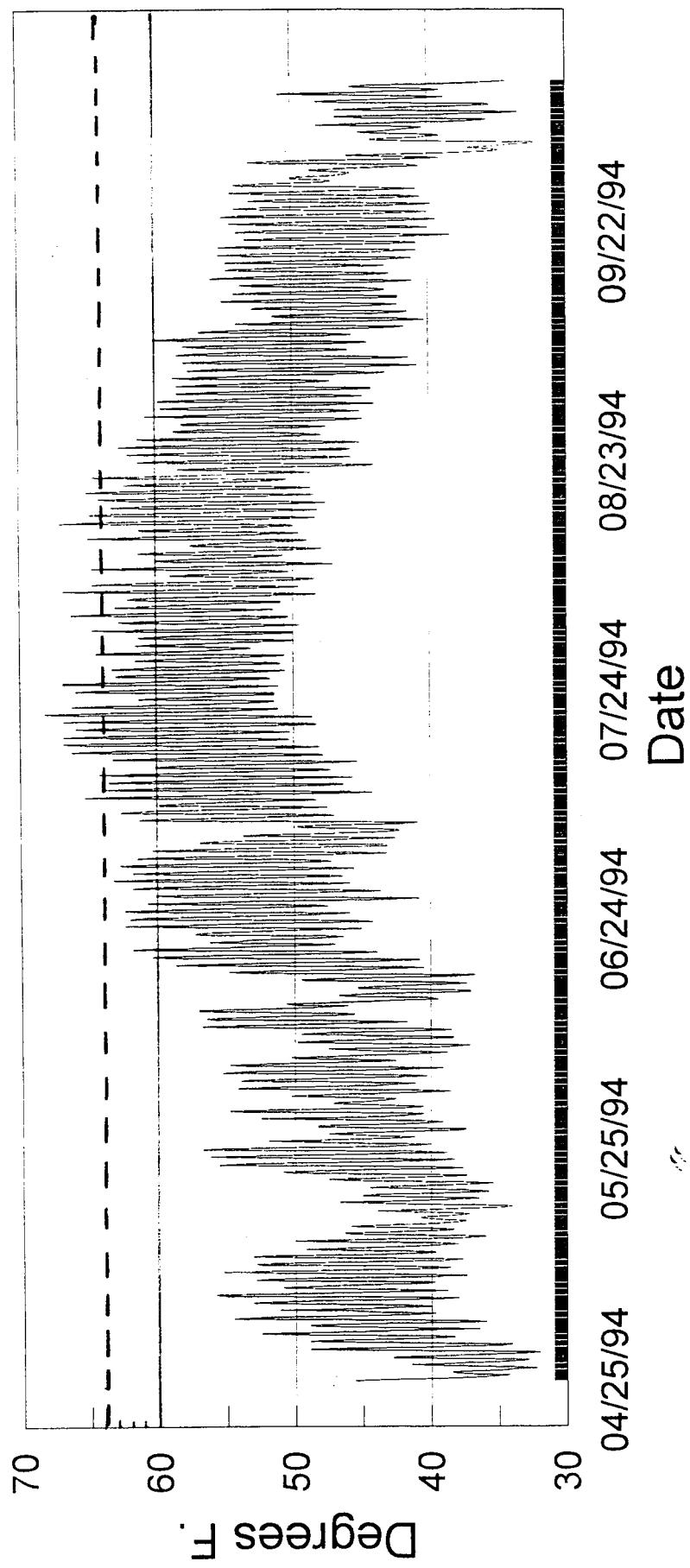
**Little Hat Creek  
1994 HOBO Temperatures**



## Big Eightmile Creek (above USFS boundary) 1994 HOBO Temperatures

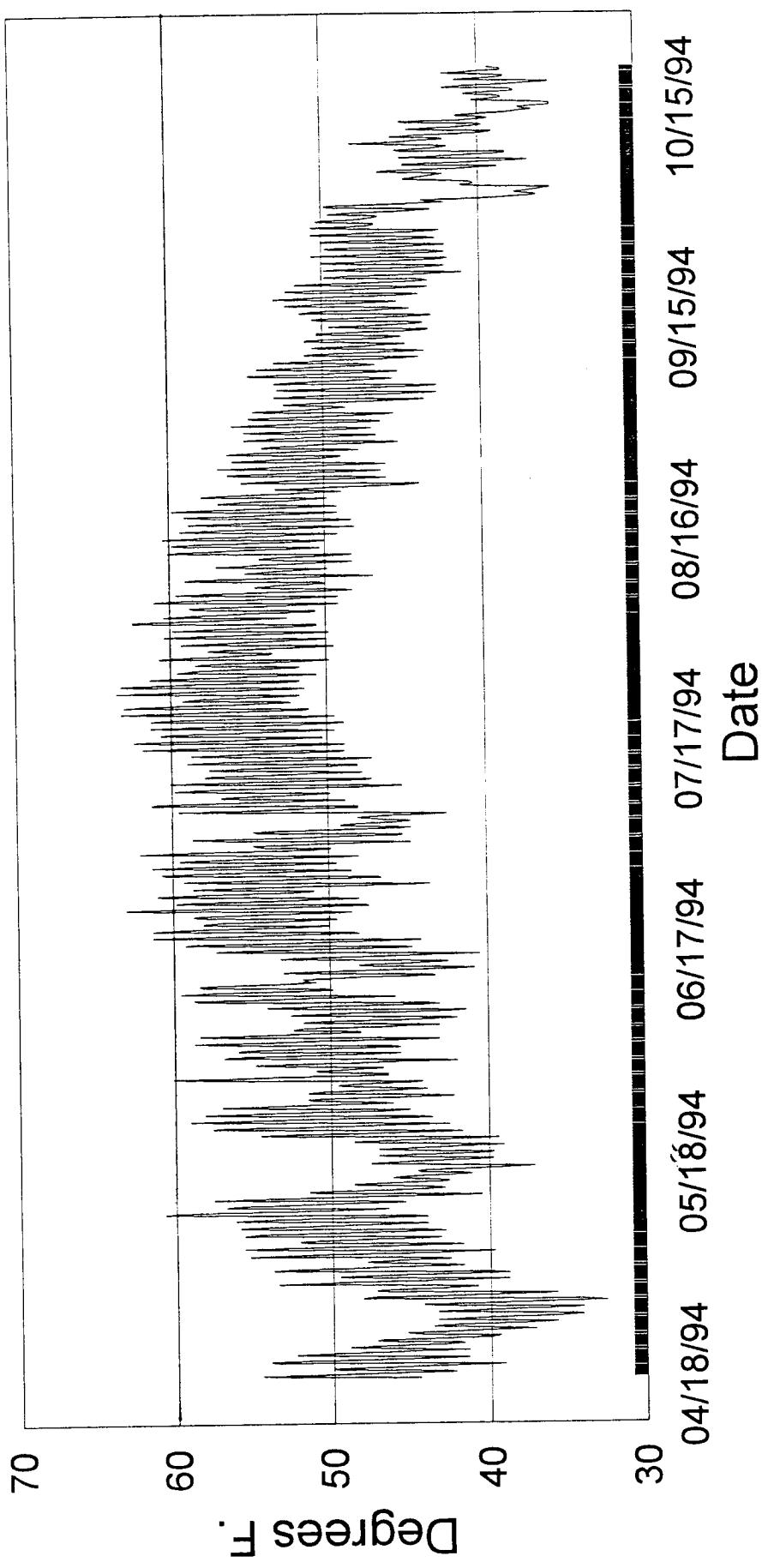


**Big Timber Cr. (below Basin Creek)**  
**1994 HOBO Temperatures**

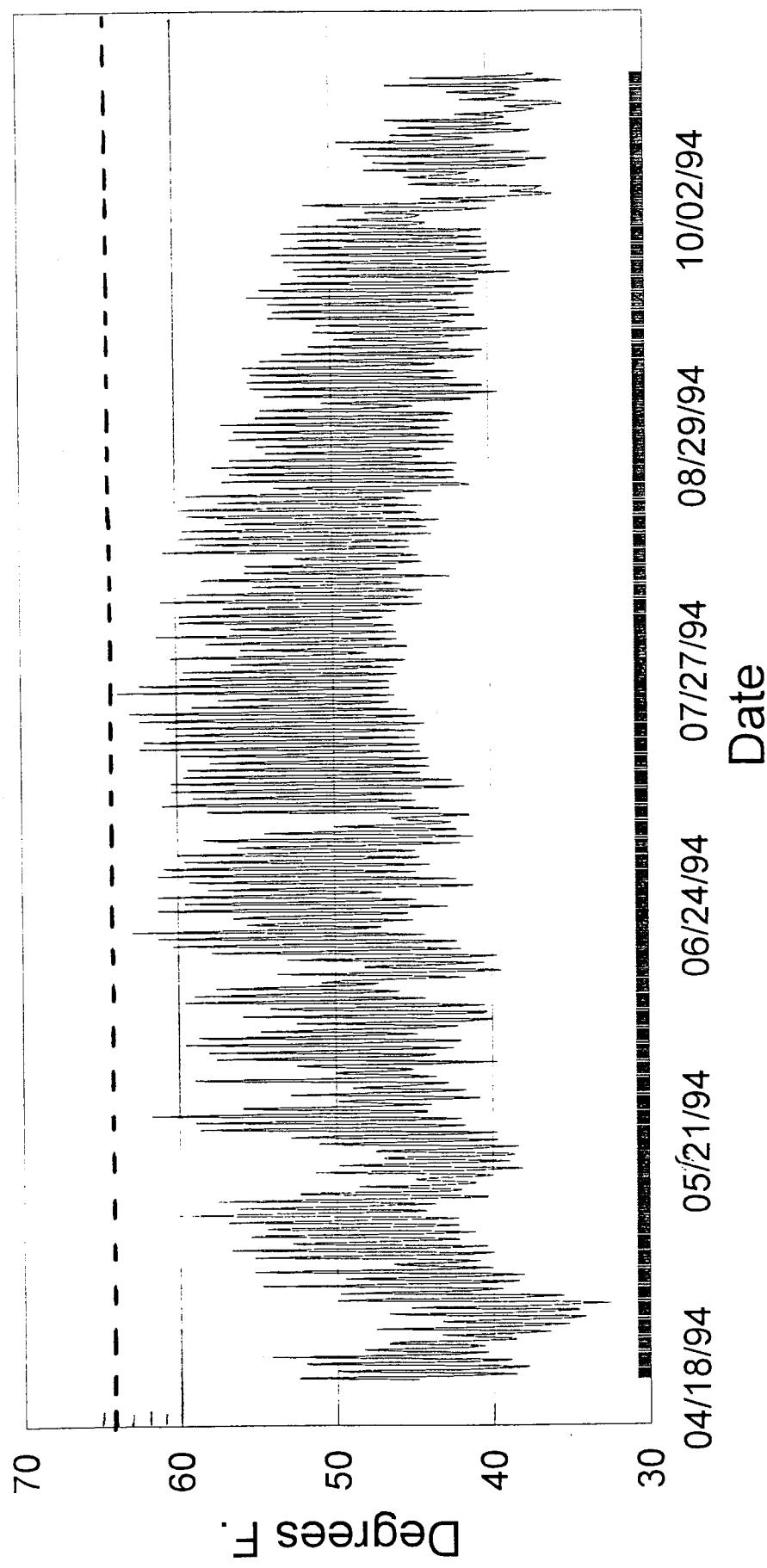


03/14/96  
e:\hobog94\FSHOB01.wk4

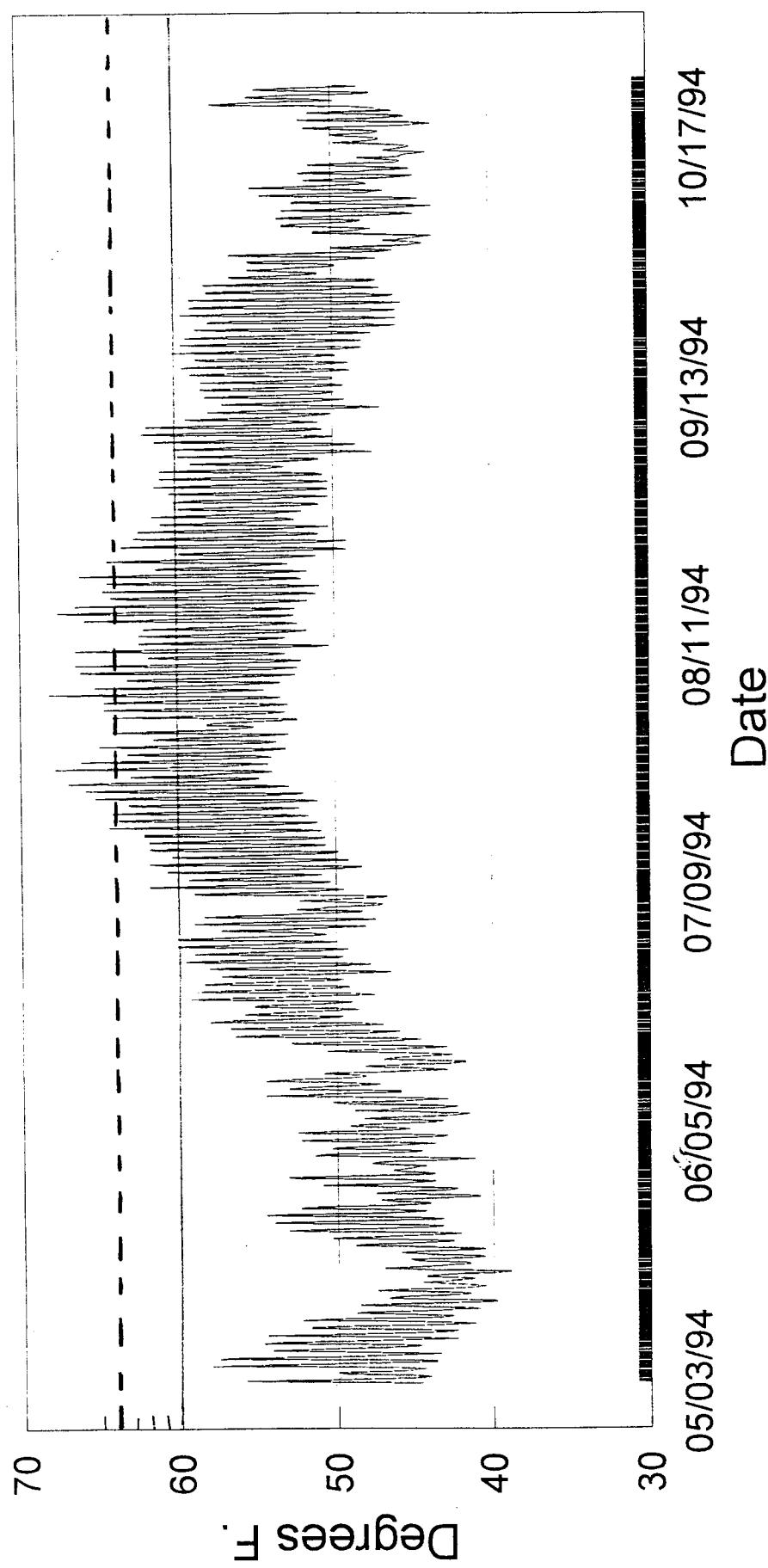
**Canyon Creek at USFS Boundary  
1994 HOBO Temperatures**



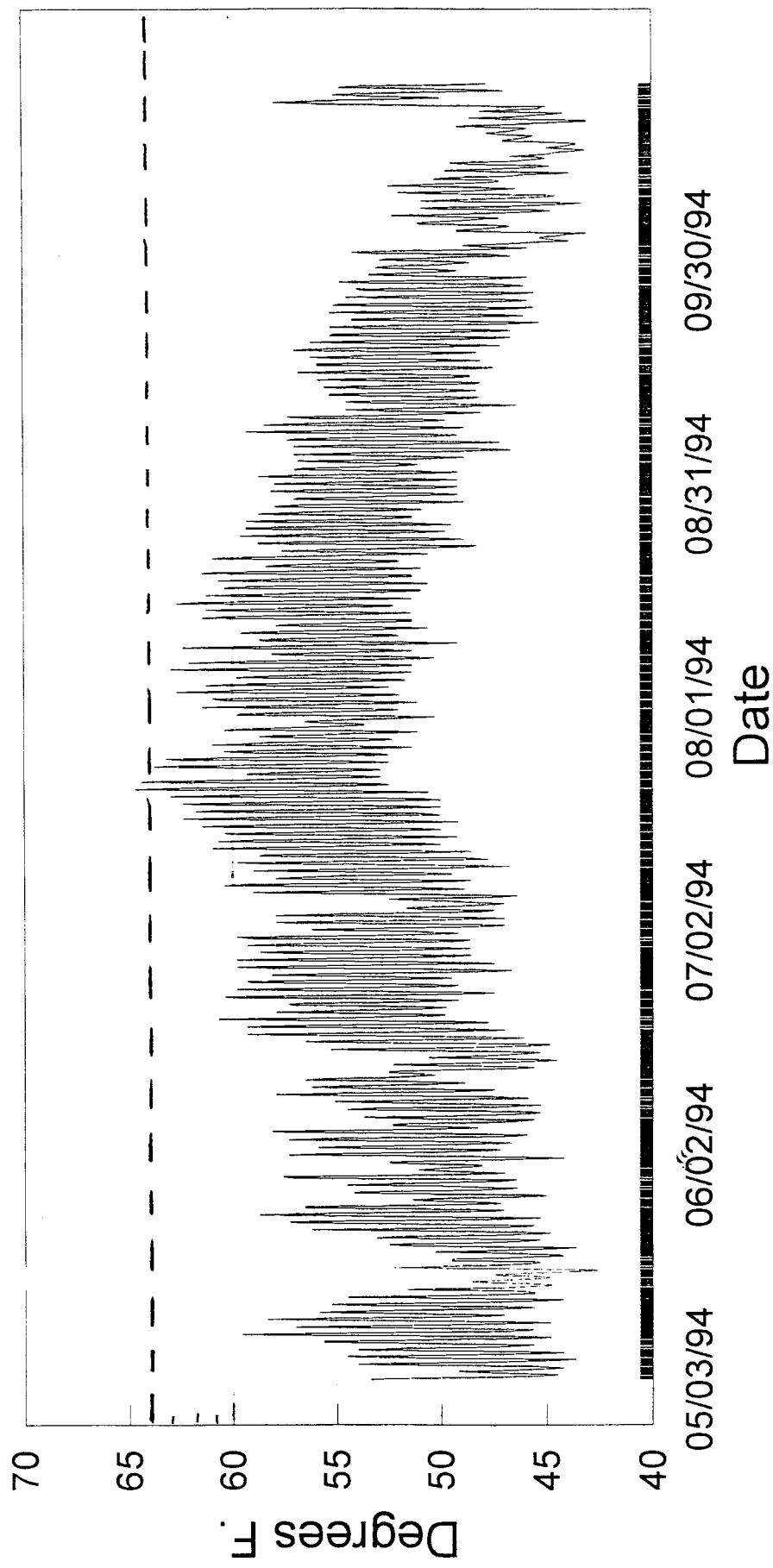
Hawley Creek above USFS Boundary  
1994 HOBO Temperatures



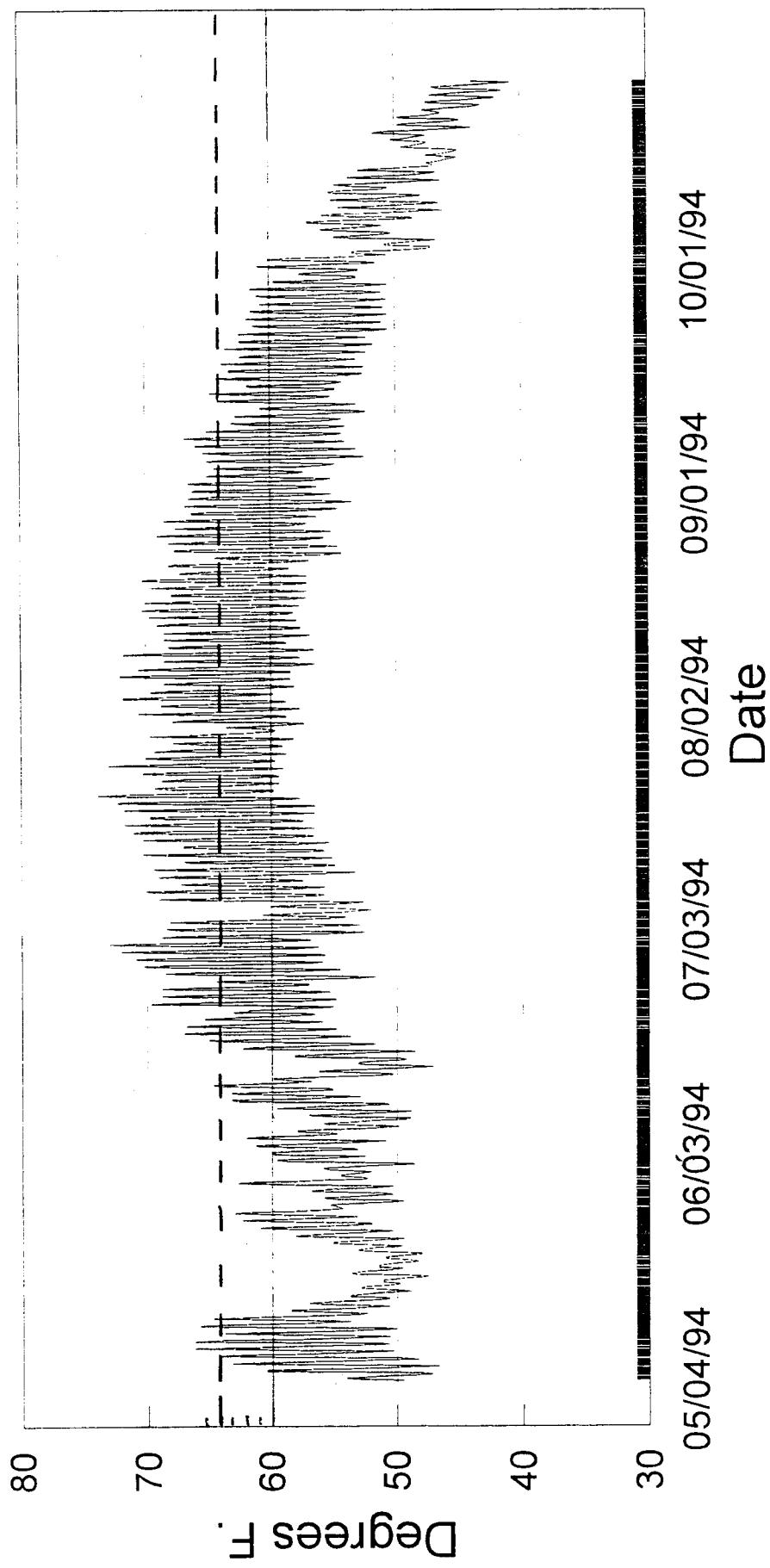
## Hayden Creek at USFS Guard Station 1994 HOBO Temperatures



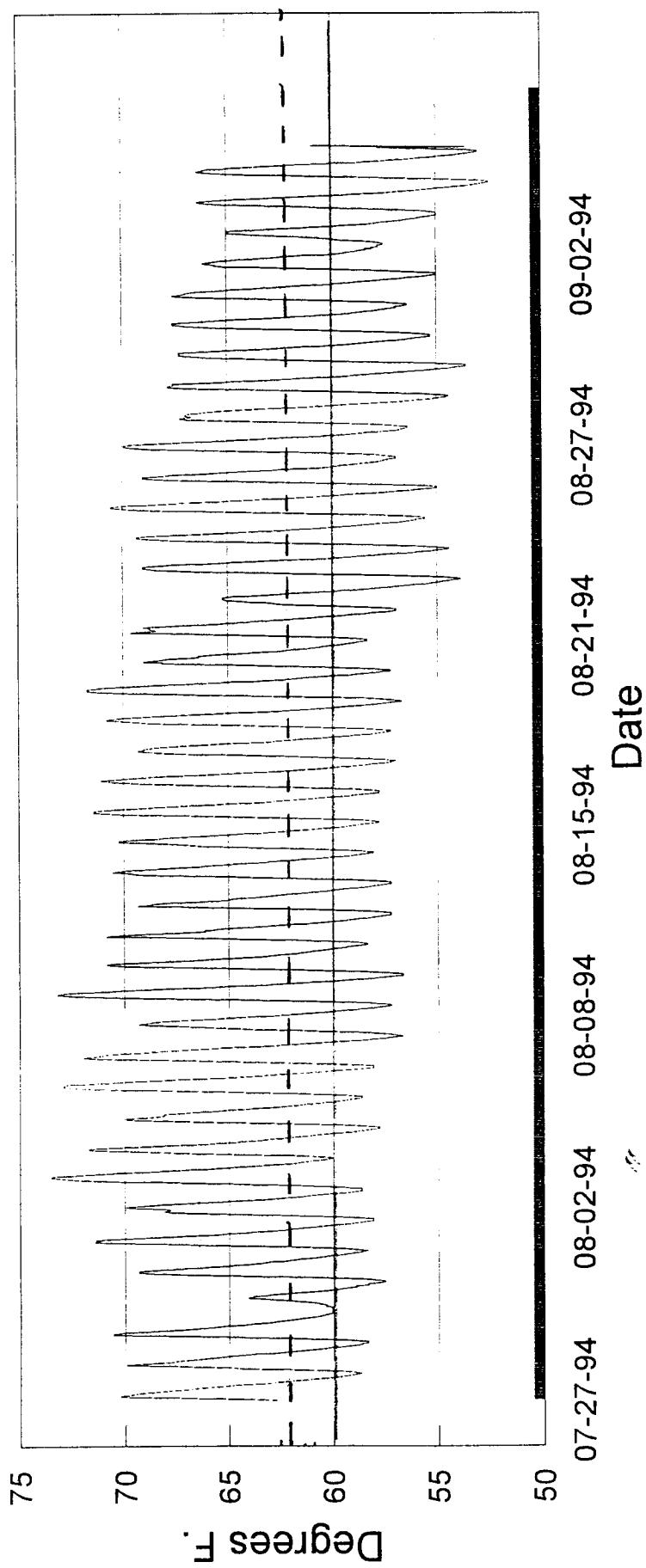
**Lemhi River above Hayden Creek  
1994 HOBO Temperatures**



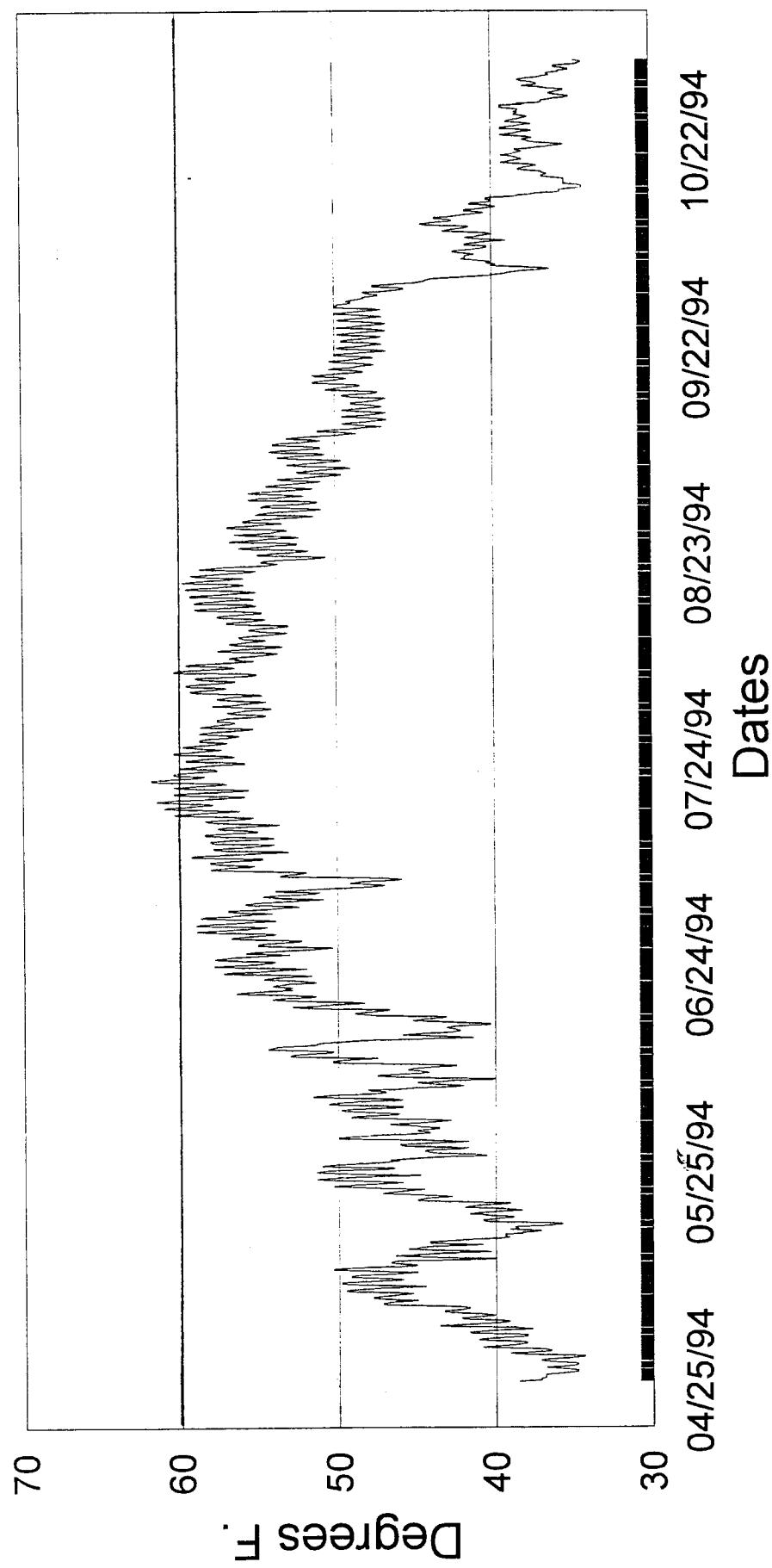
**Lemhi River above Mouth  
1994 HOBO Temperatures**



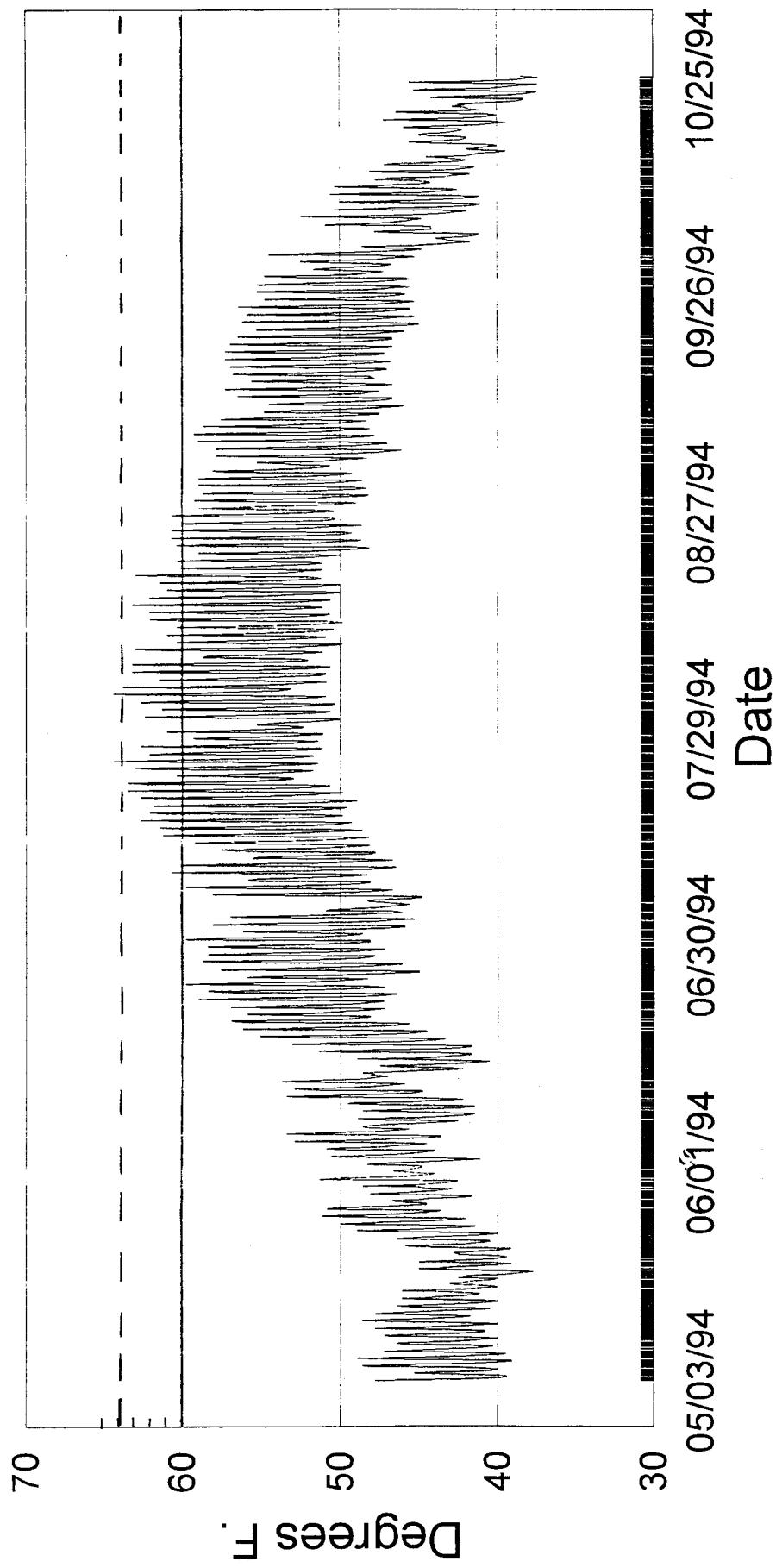
Lemhi River  
1994 HOBO Temperatures



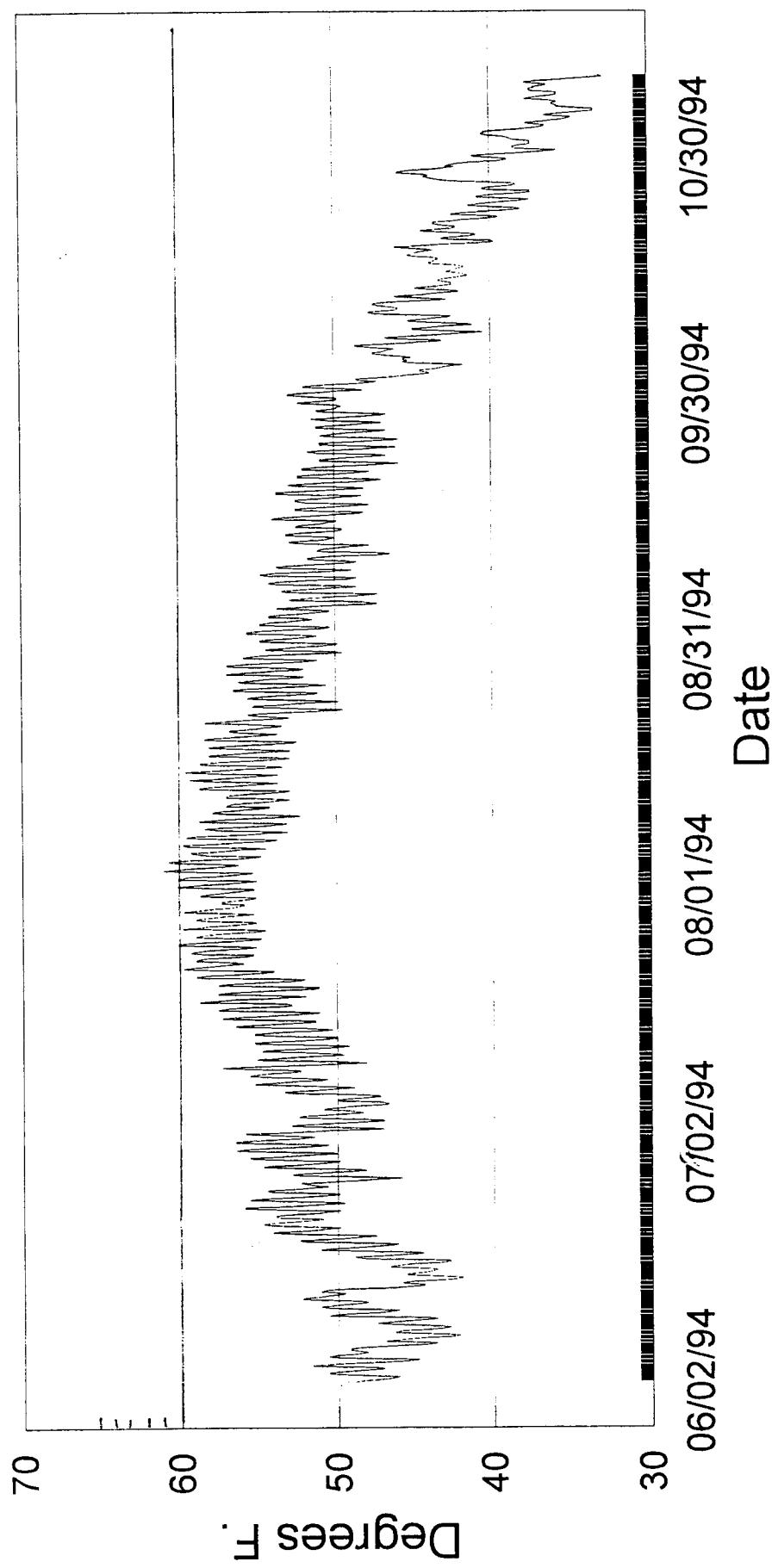
**Middle Fork Little Timber Creek  
1994 HOBO Temperatures**



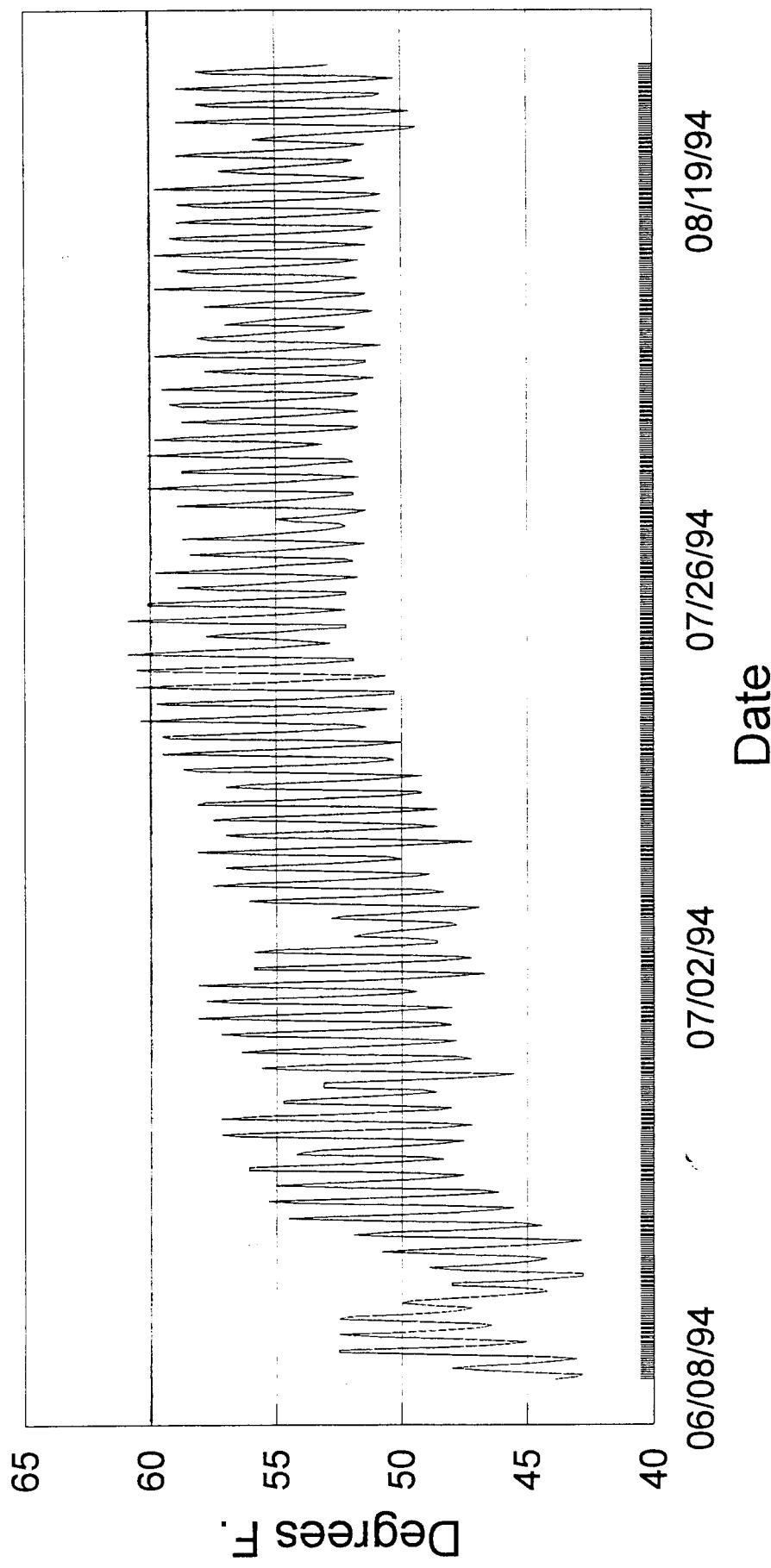
**Pattee Creek below USFS Boundary  
1994 HOBO Temperatures**



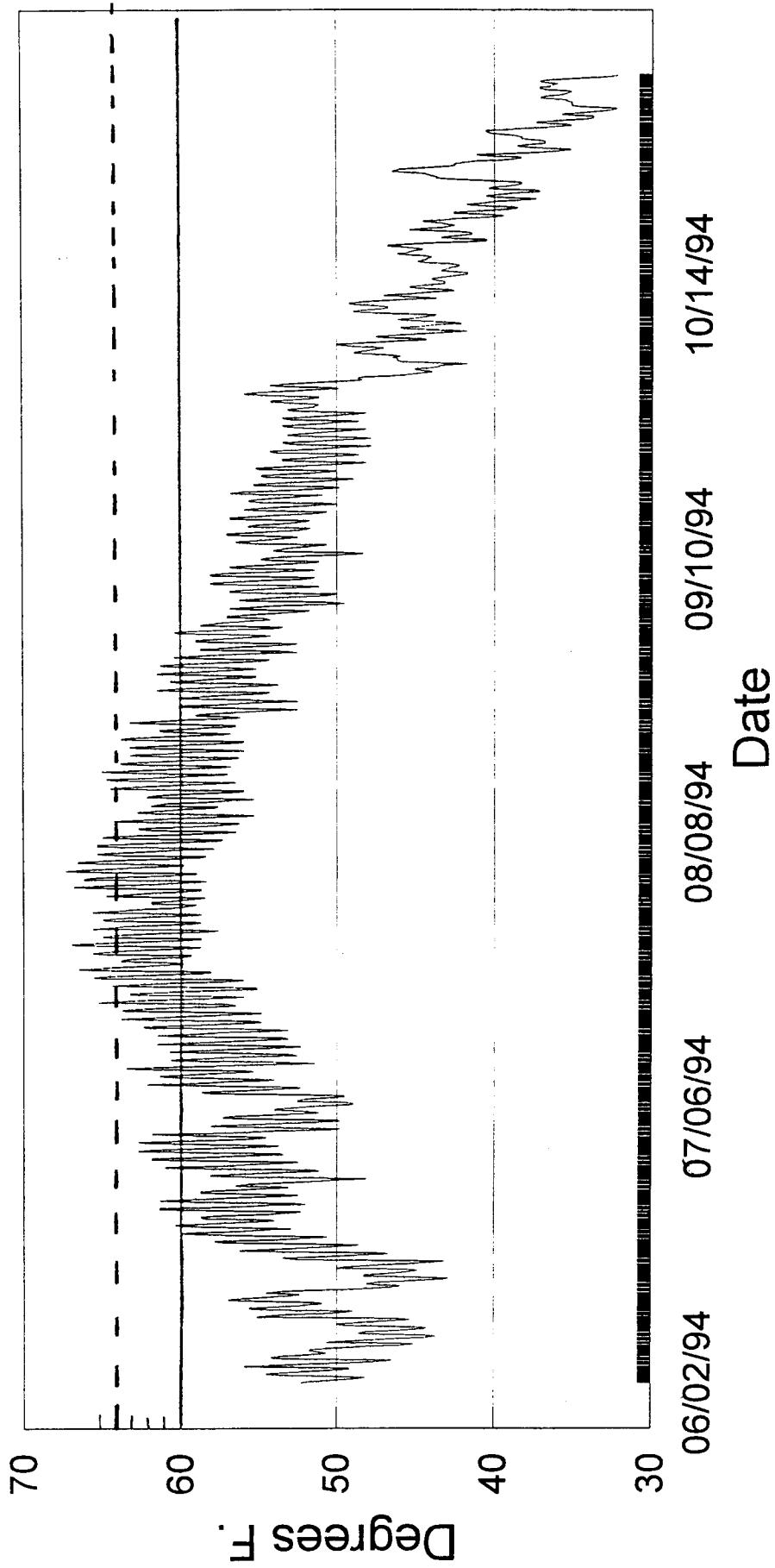
**Colson Creek**  
**1994 HOBO Temperatures**



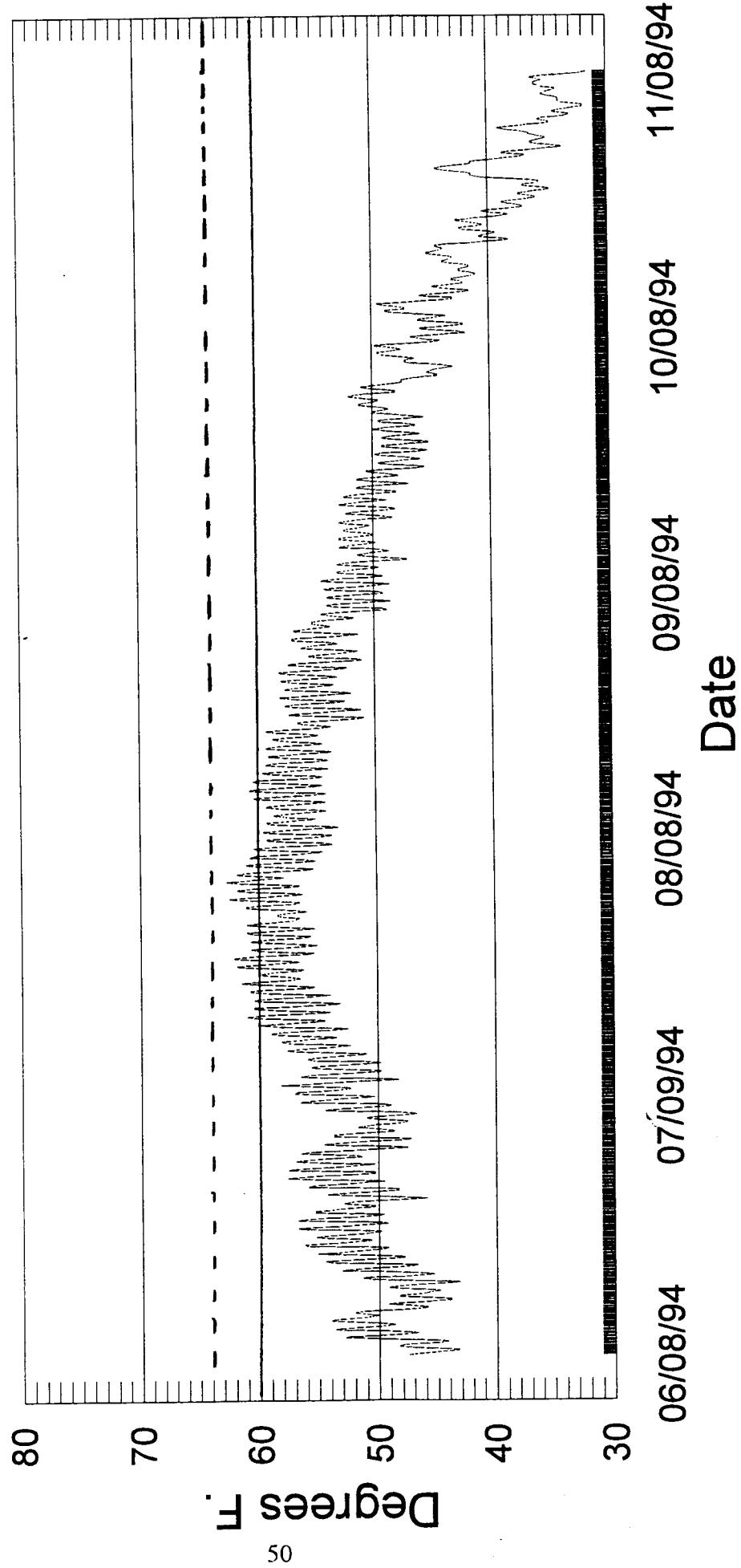
**Indian Creek**  
**1994 HOBO Temperatures**



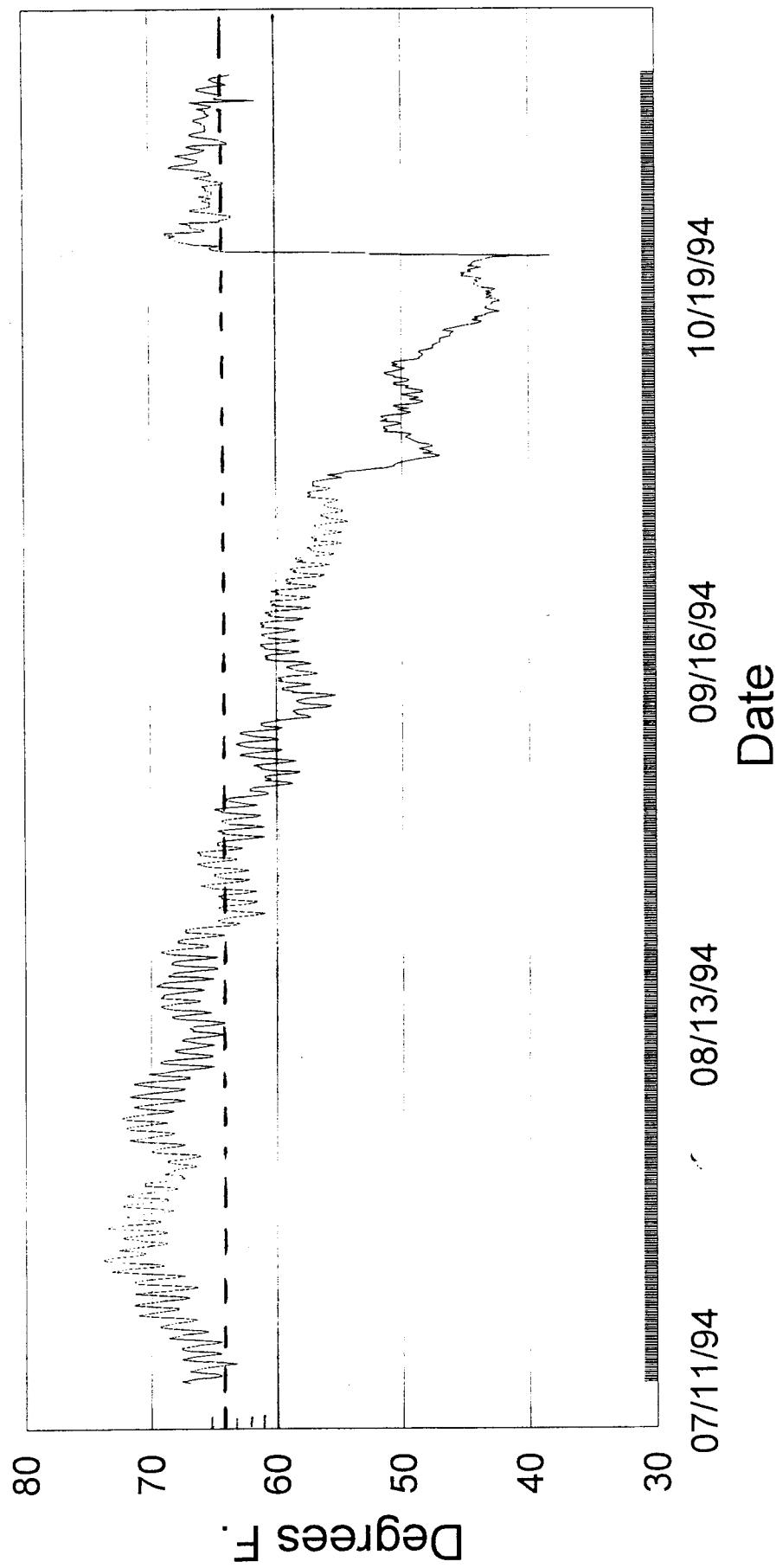
Owl Creek  
1994 HOBO Temperatures



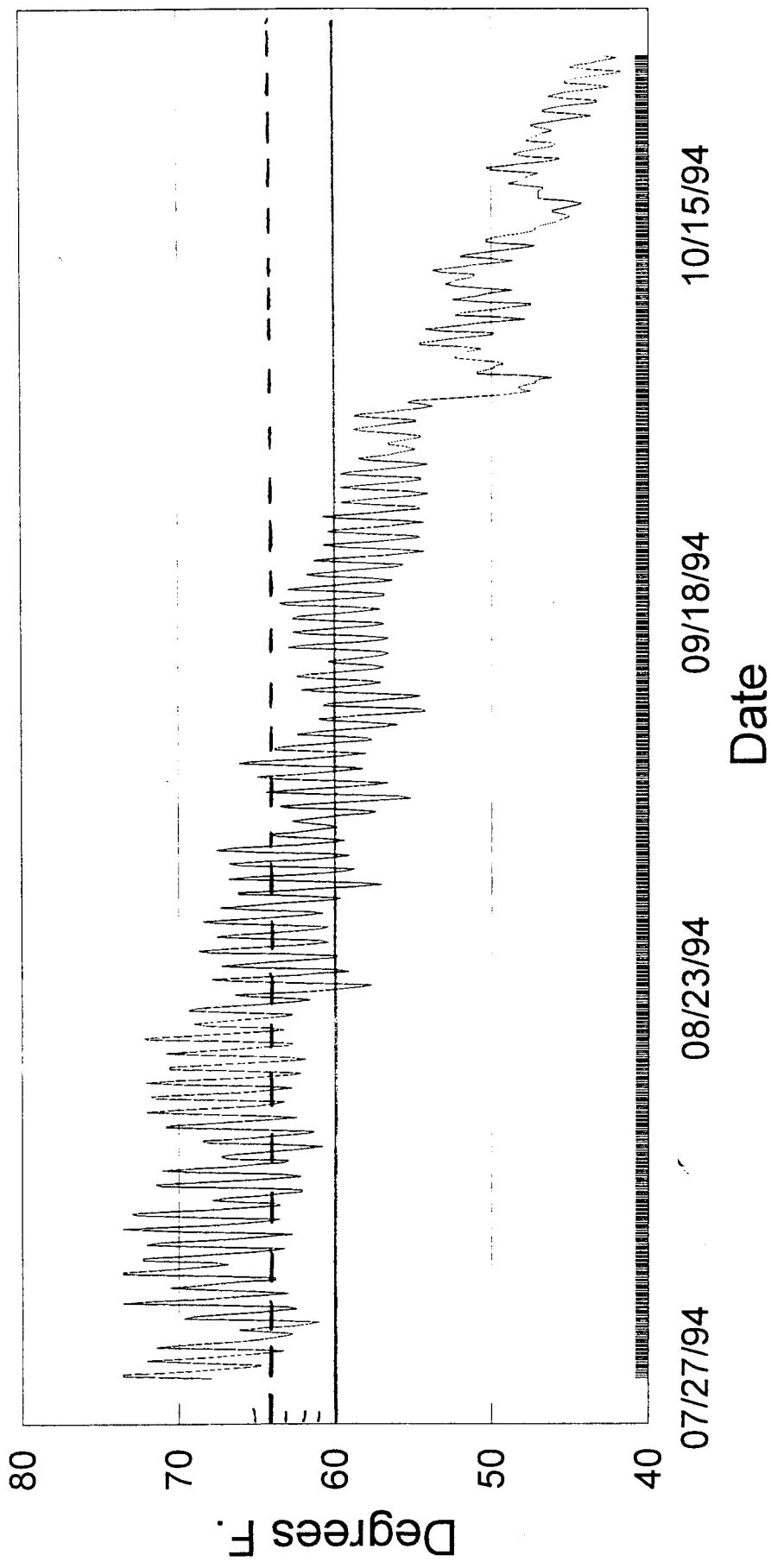
Pine Creek  
1994 HOBO Temperatures



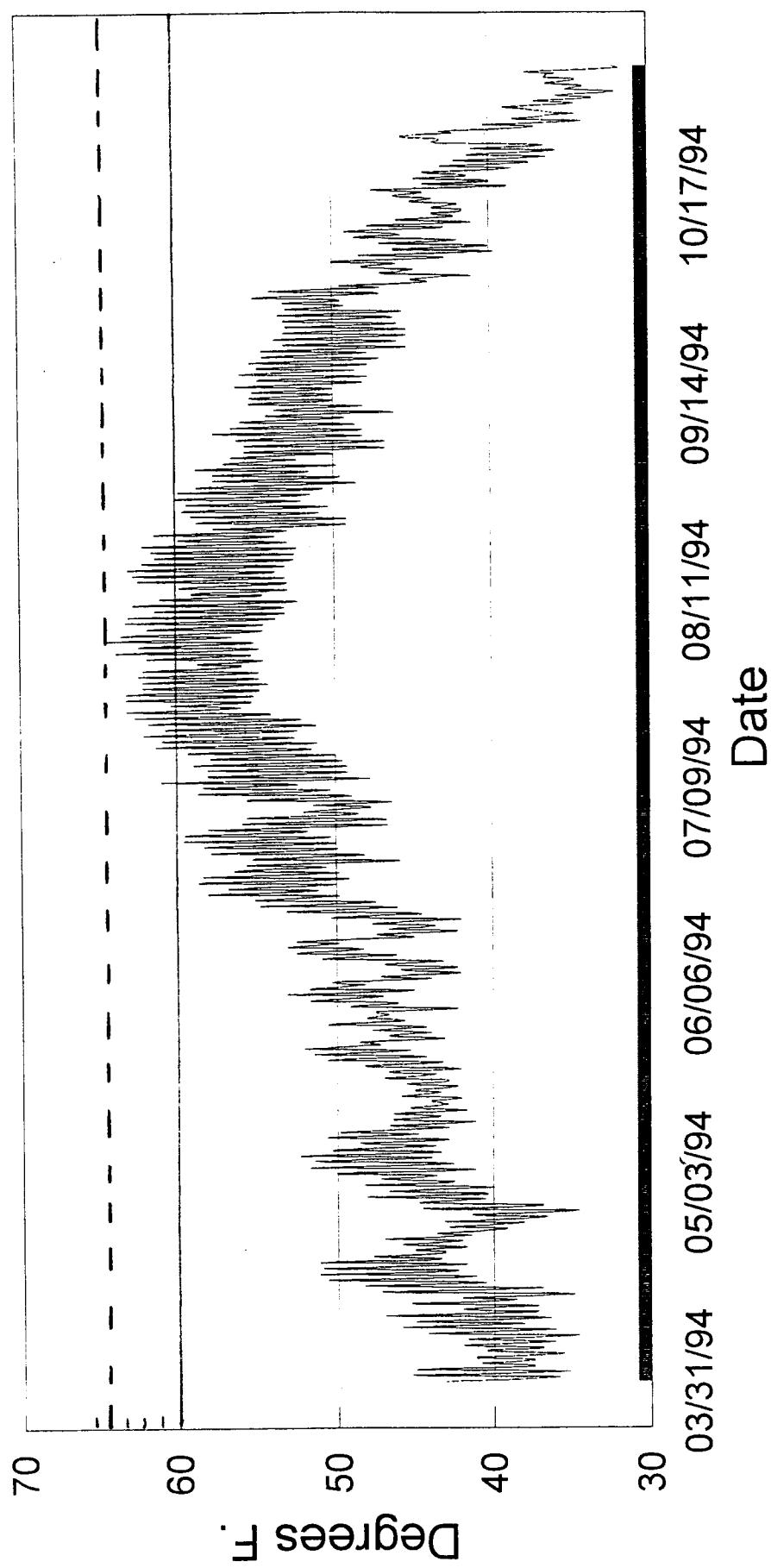
**Salmon River above Corn Creek  
1994 HOBO Temperatures**



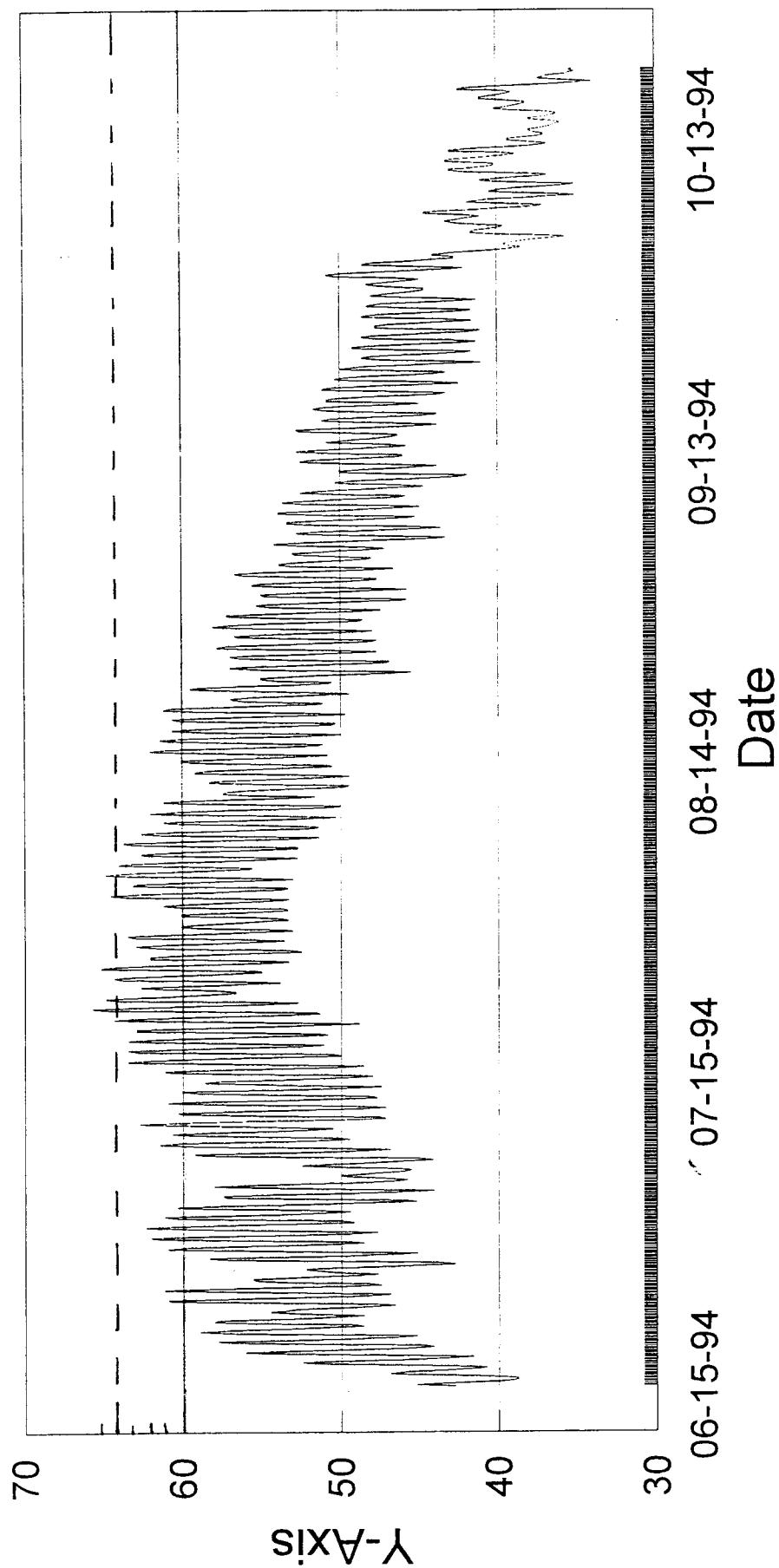
**Salmon River at Newland Ranch Bridge  
1994 HOBO Temperatures**



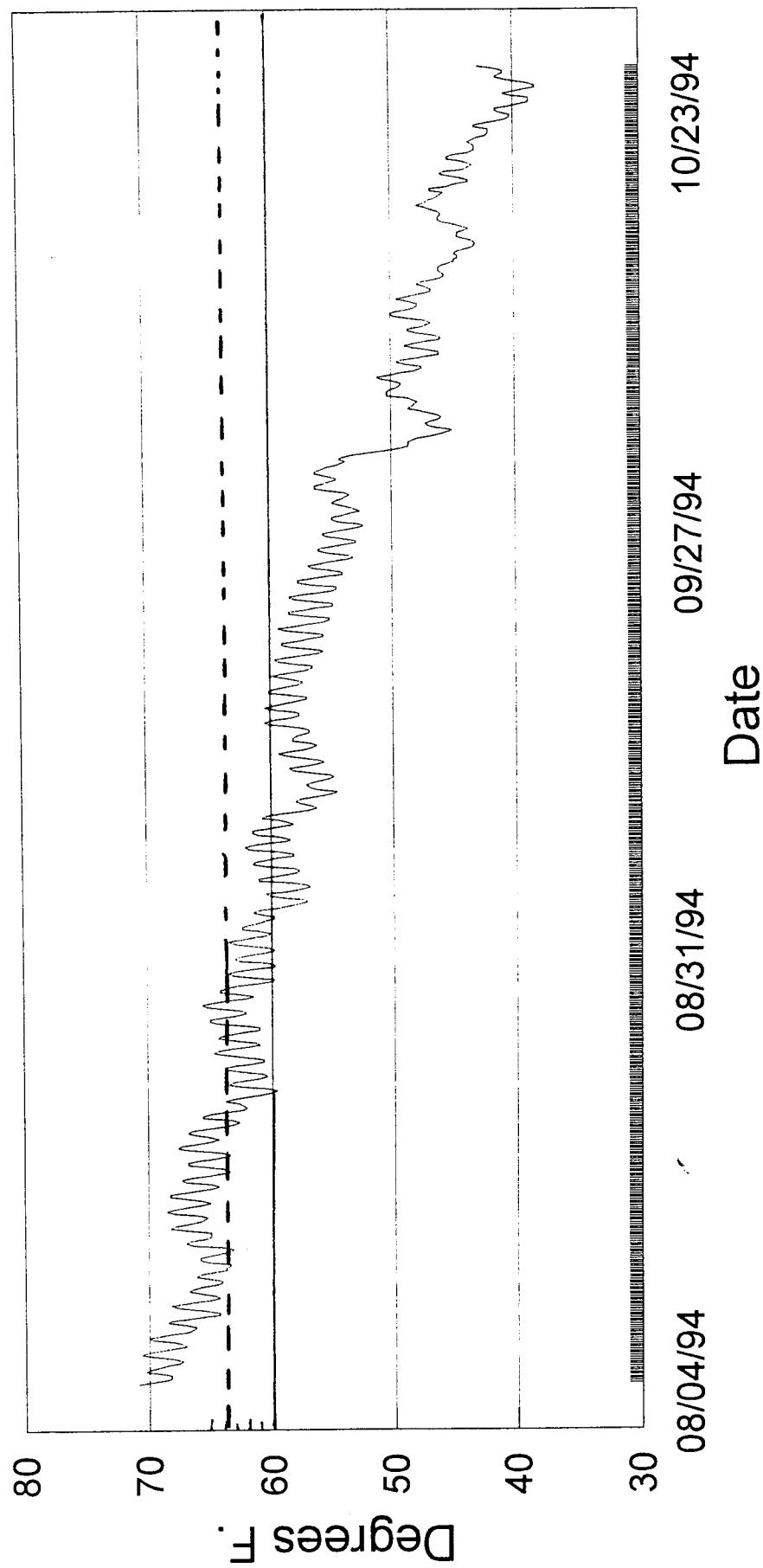
**Spring Creek  
1994 HOBO Temperatures**



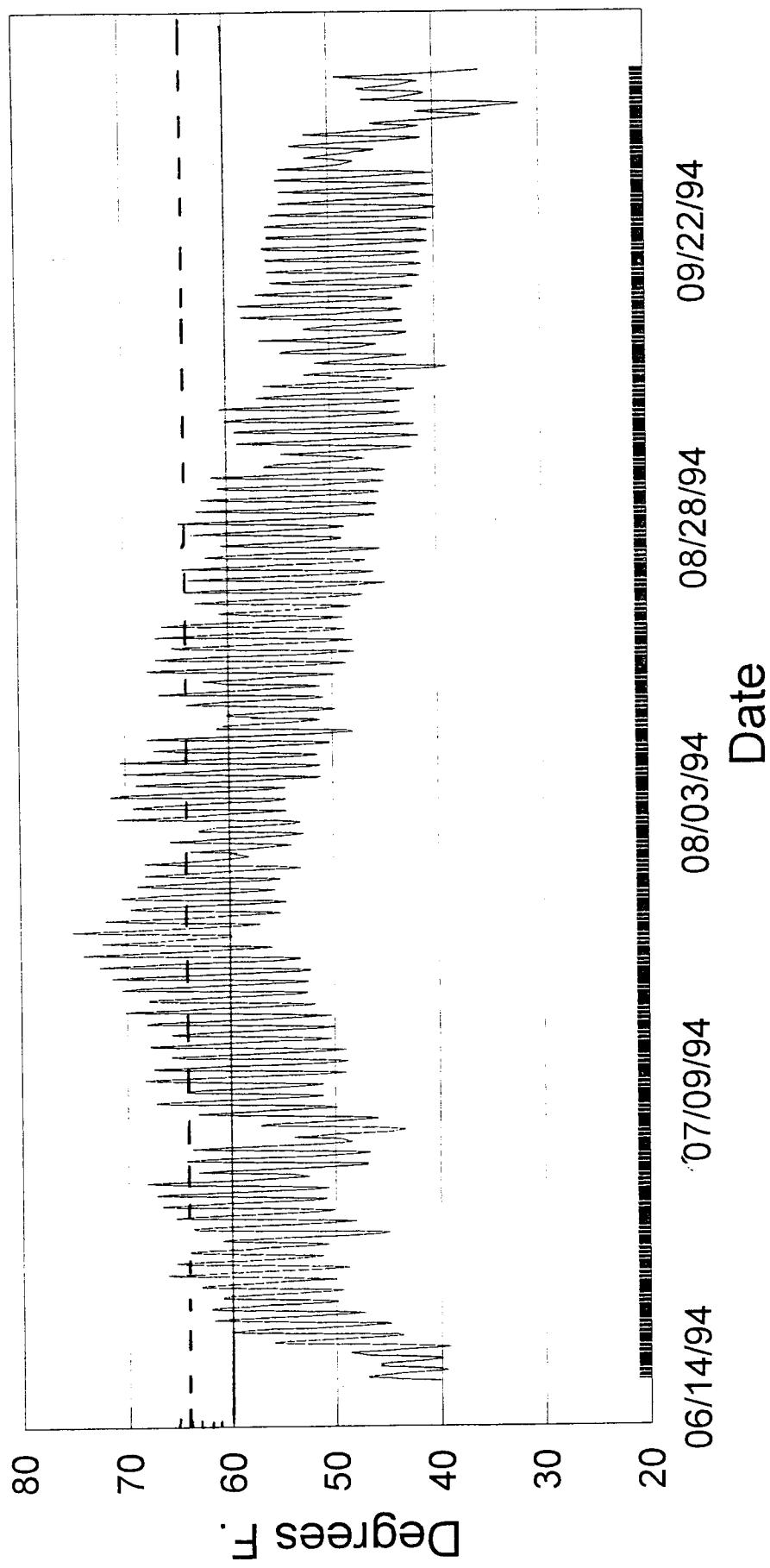
## Upper Horse Creek 1994 HOBO Temperatures



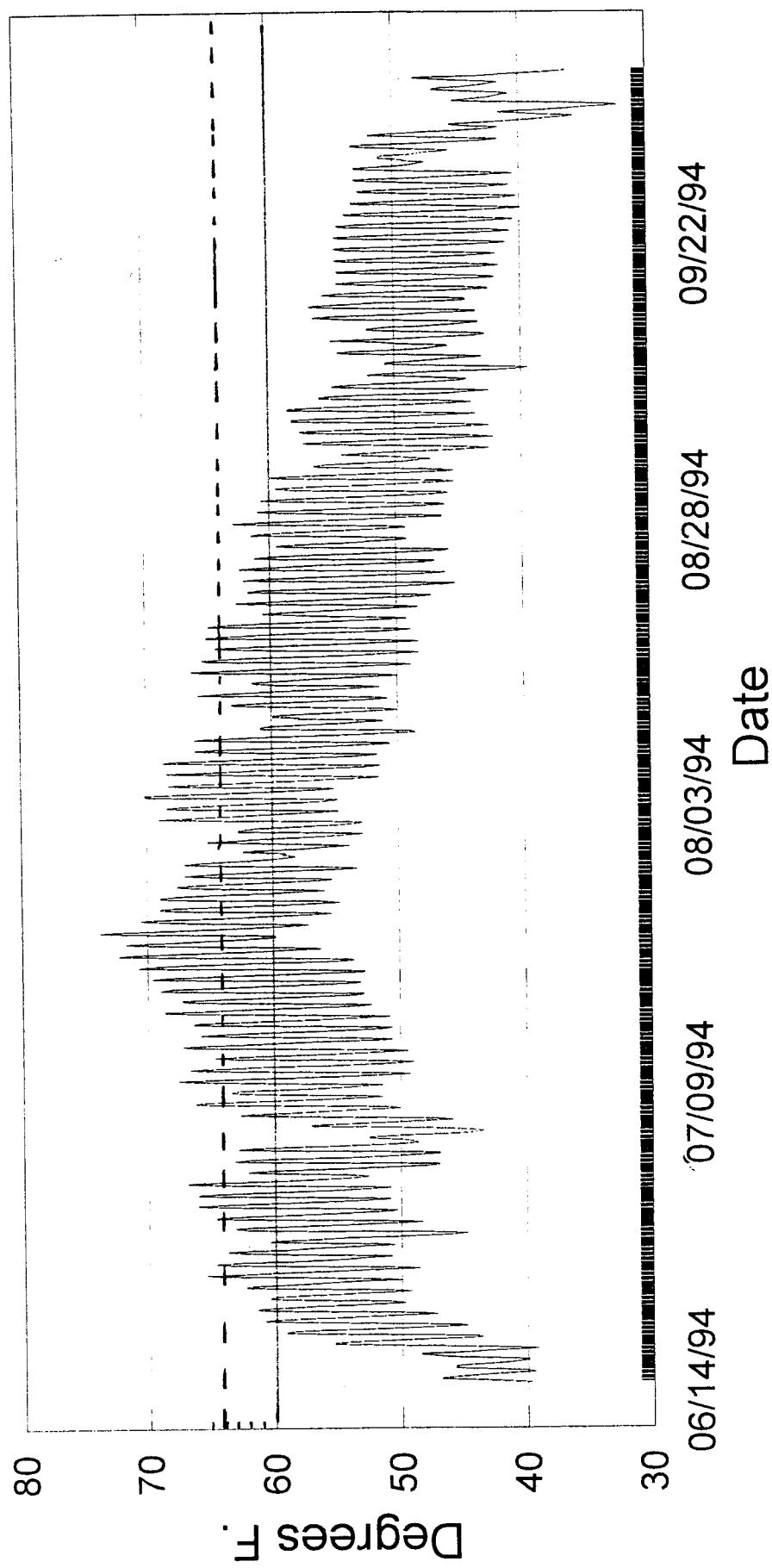
## Middle Fork Salmon River at Mouth 1994 HOBO Temperatures



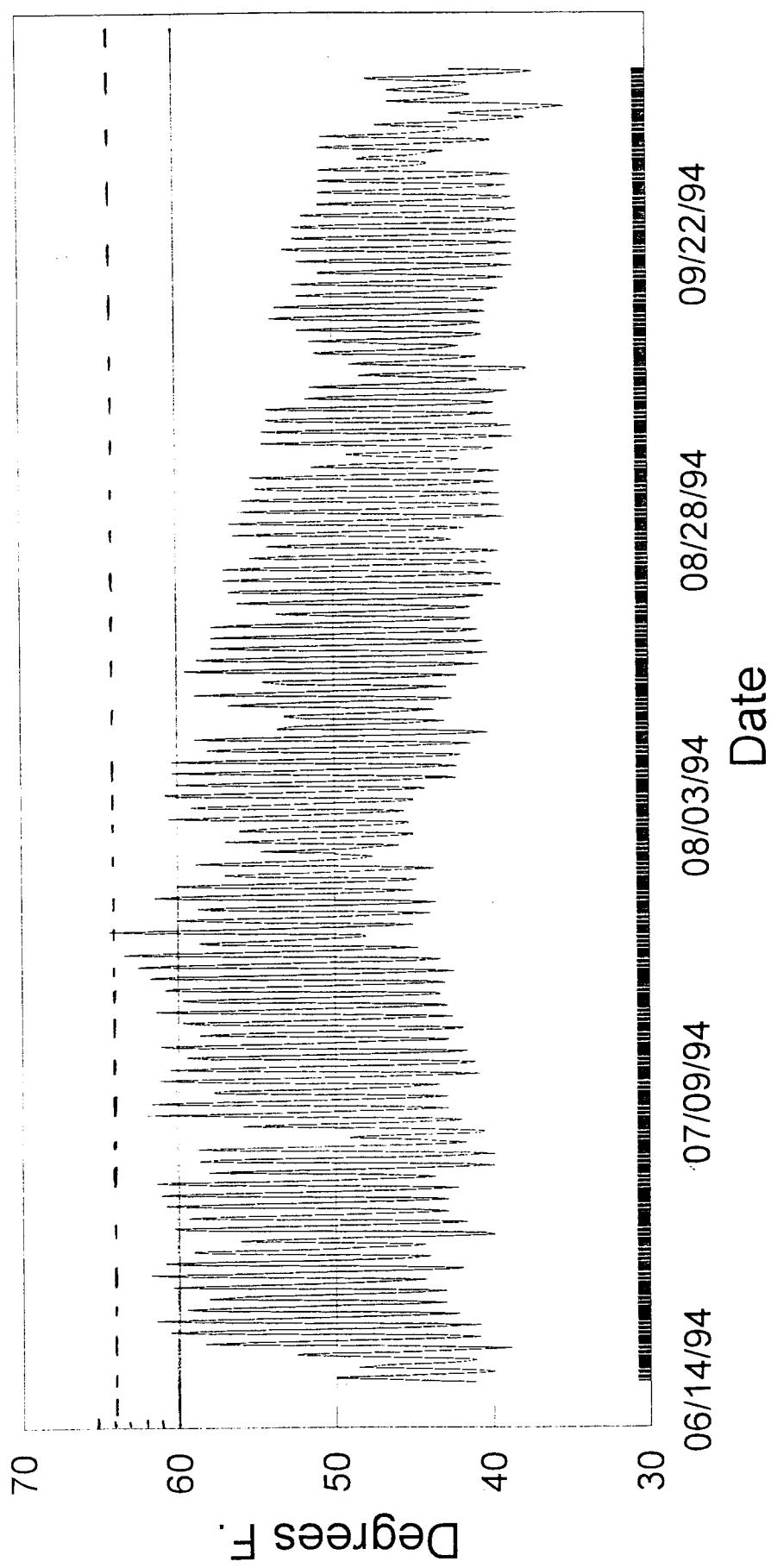
**Knapp Creek above Diversion  
1994 HOBO Temperatures**



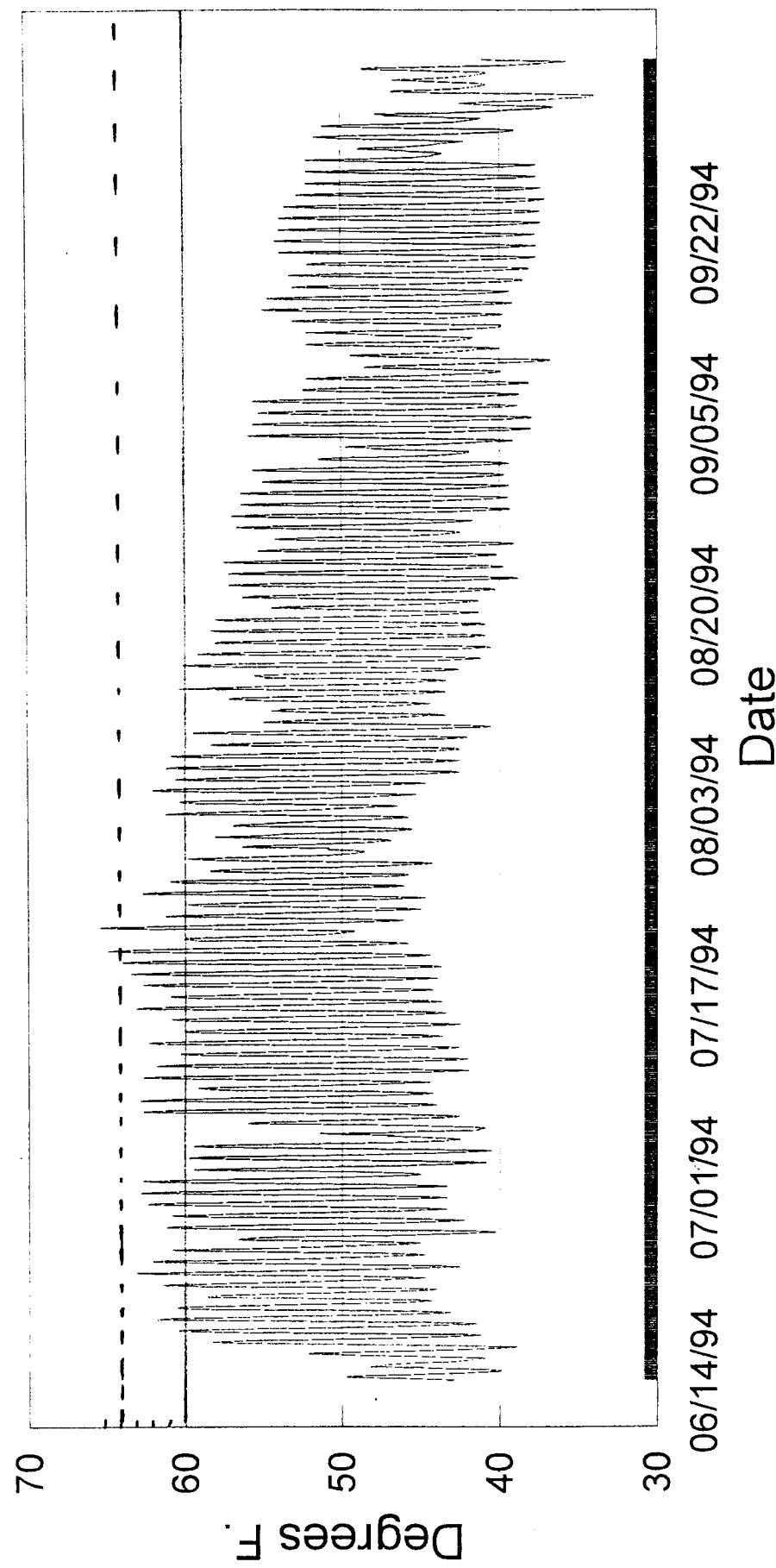
## Knapp Creek below Diversion 1994 HOBO Temperatures



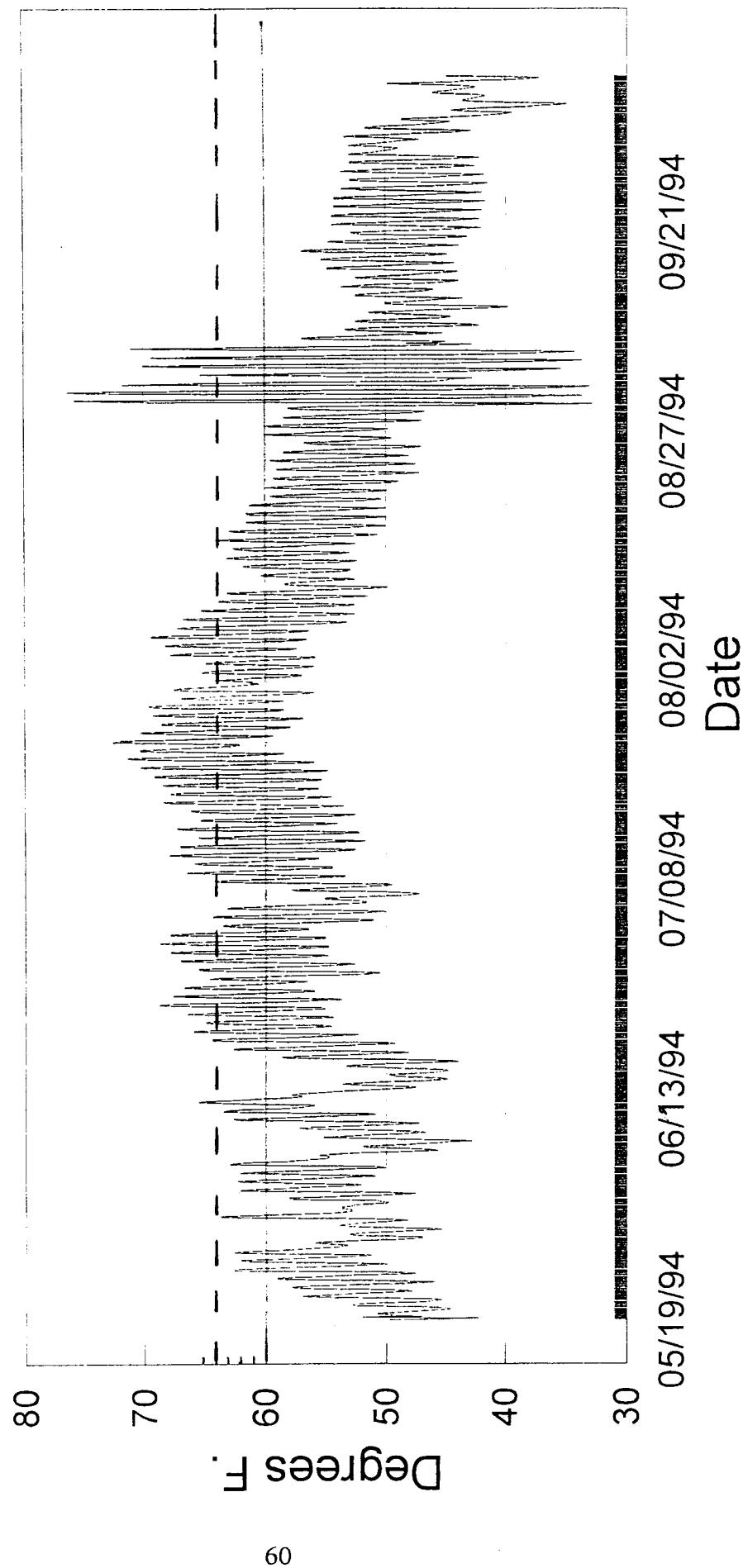
## Marsh Creek above Knapp Creek Confluence 1994 HOBO Temperatures



## Marsh Creek below Knapp Creek Confluence 1994 HOBO Temperatures

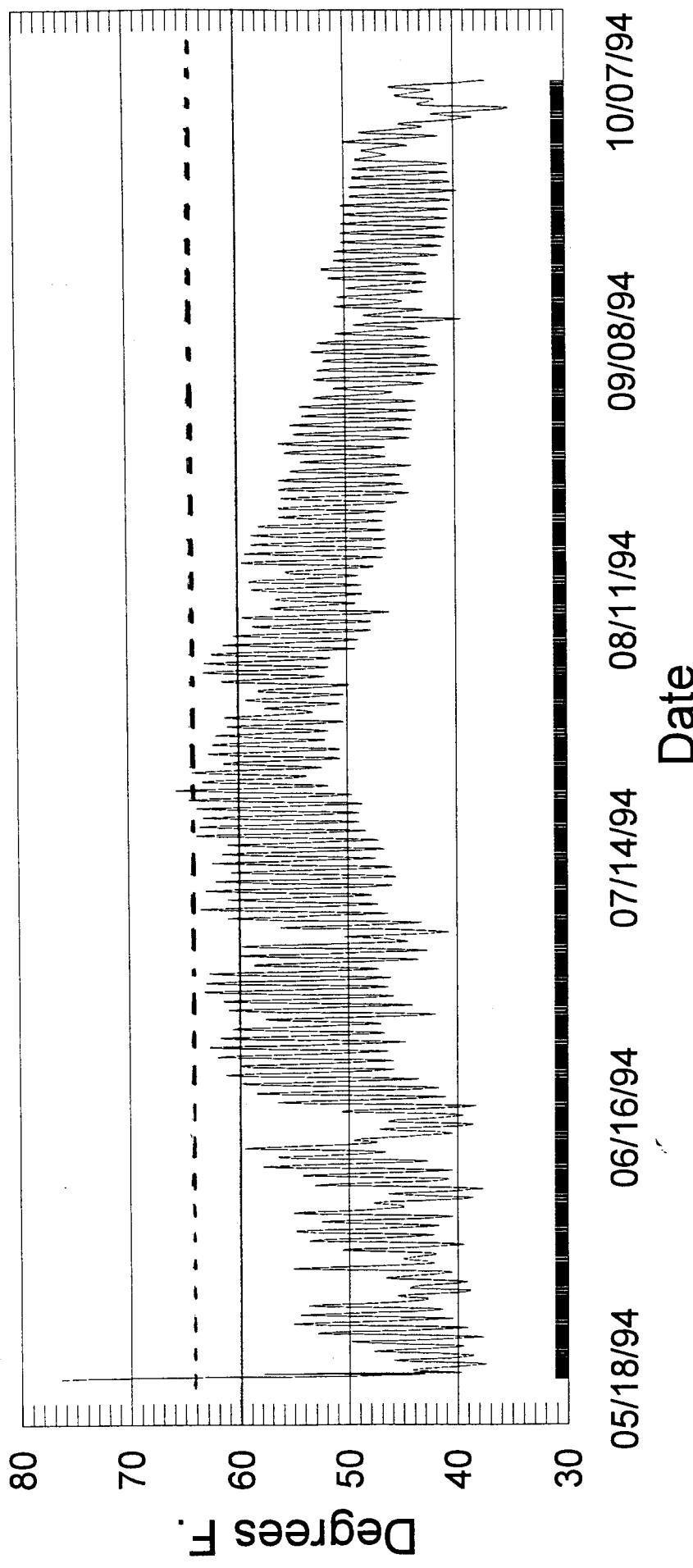


**Upper Marsh Creek  
1994 HOBO Temperatures**



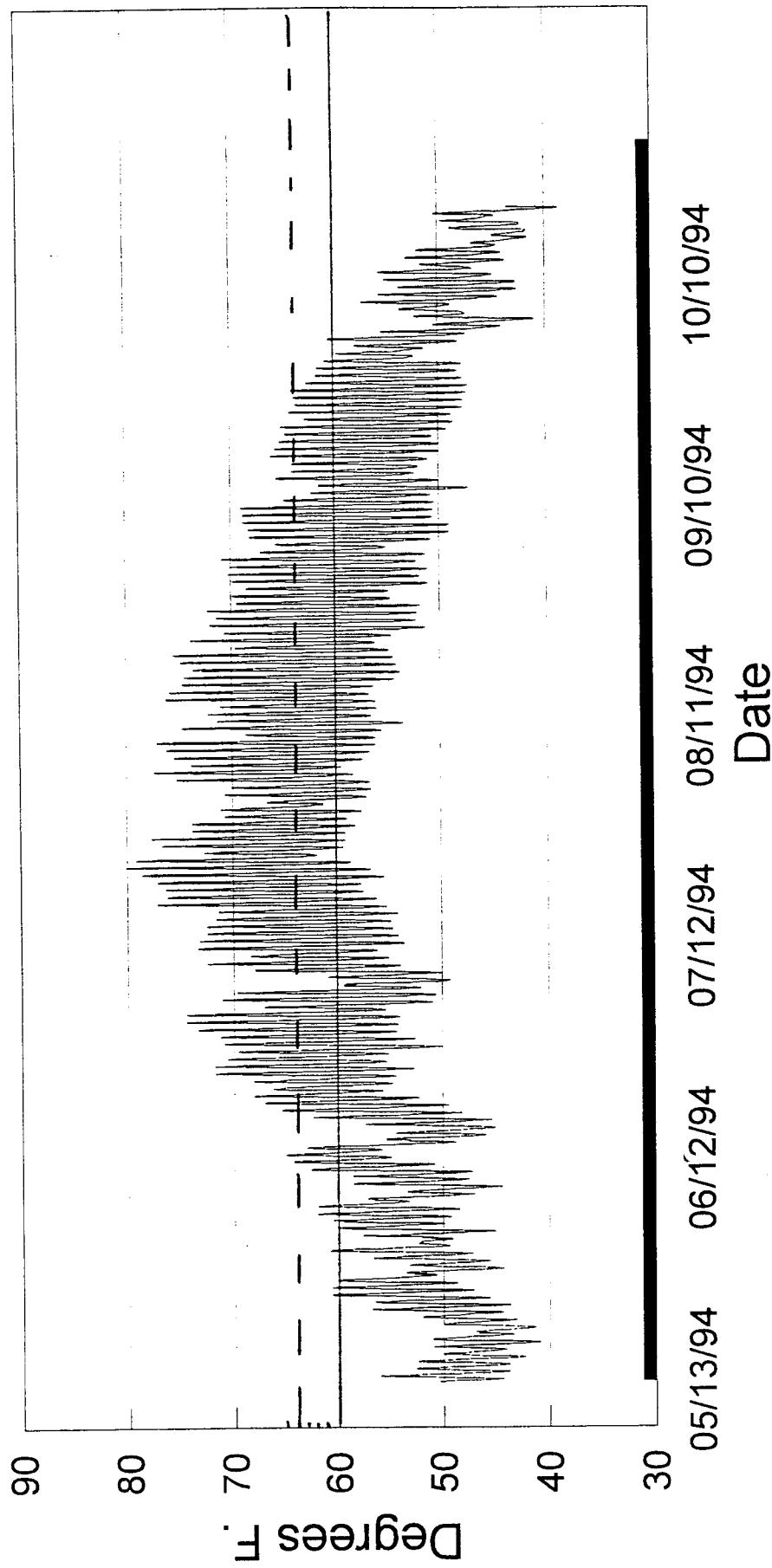
# Marsh Creek near Confluence Capehorn Creek

## 1994 HOBO Temperatures

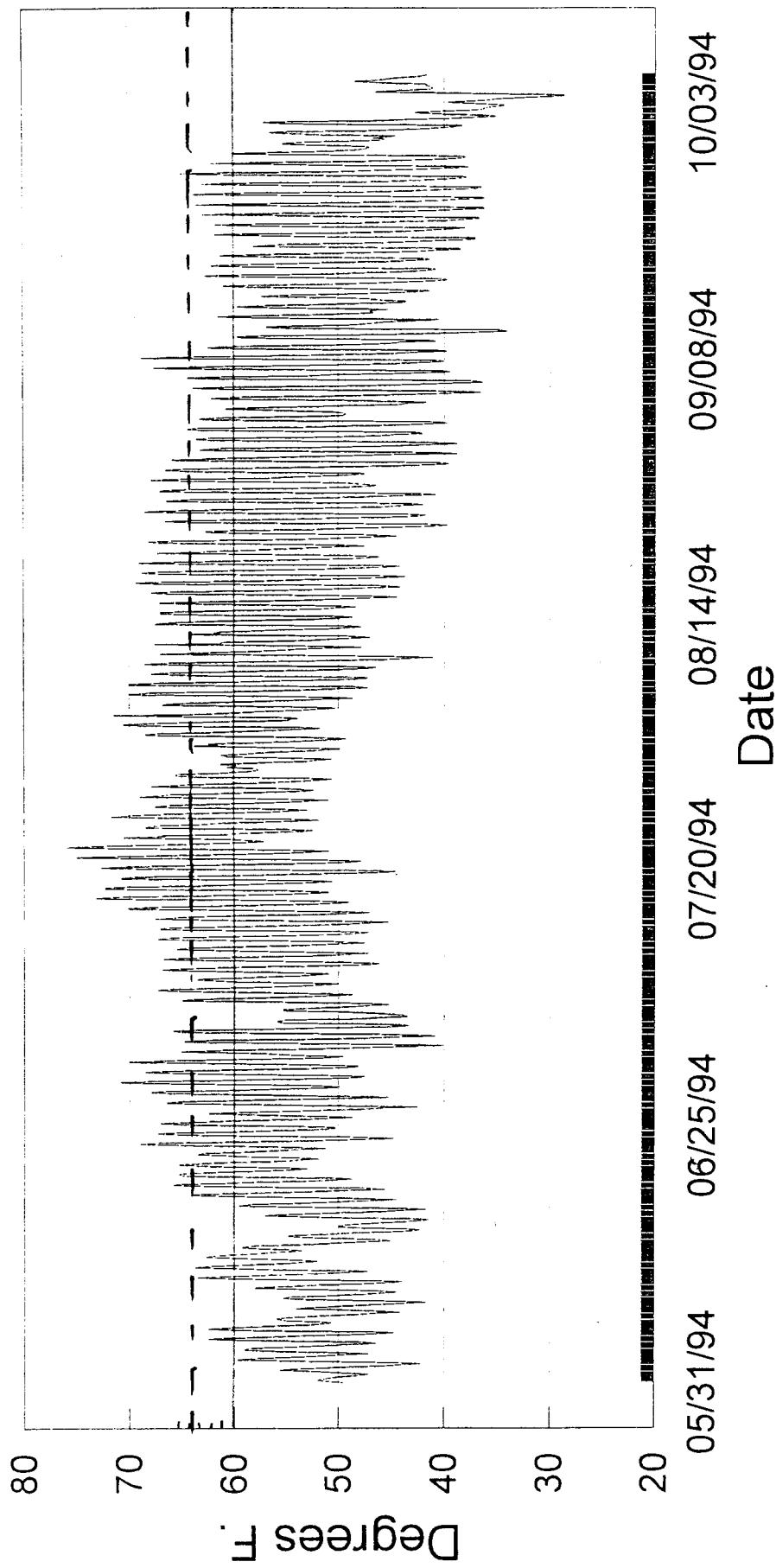


USFS

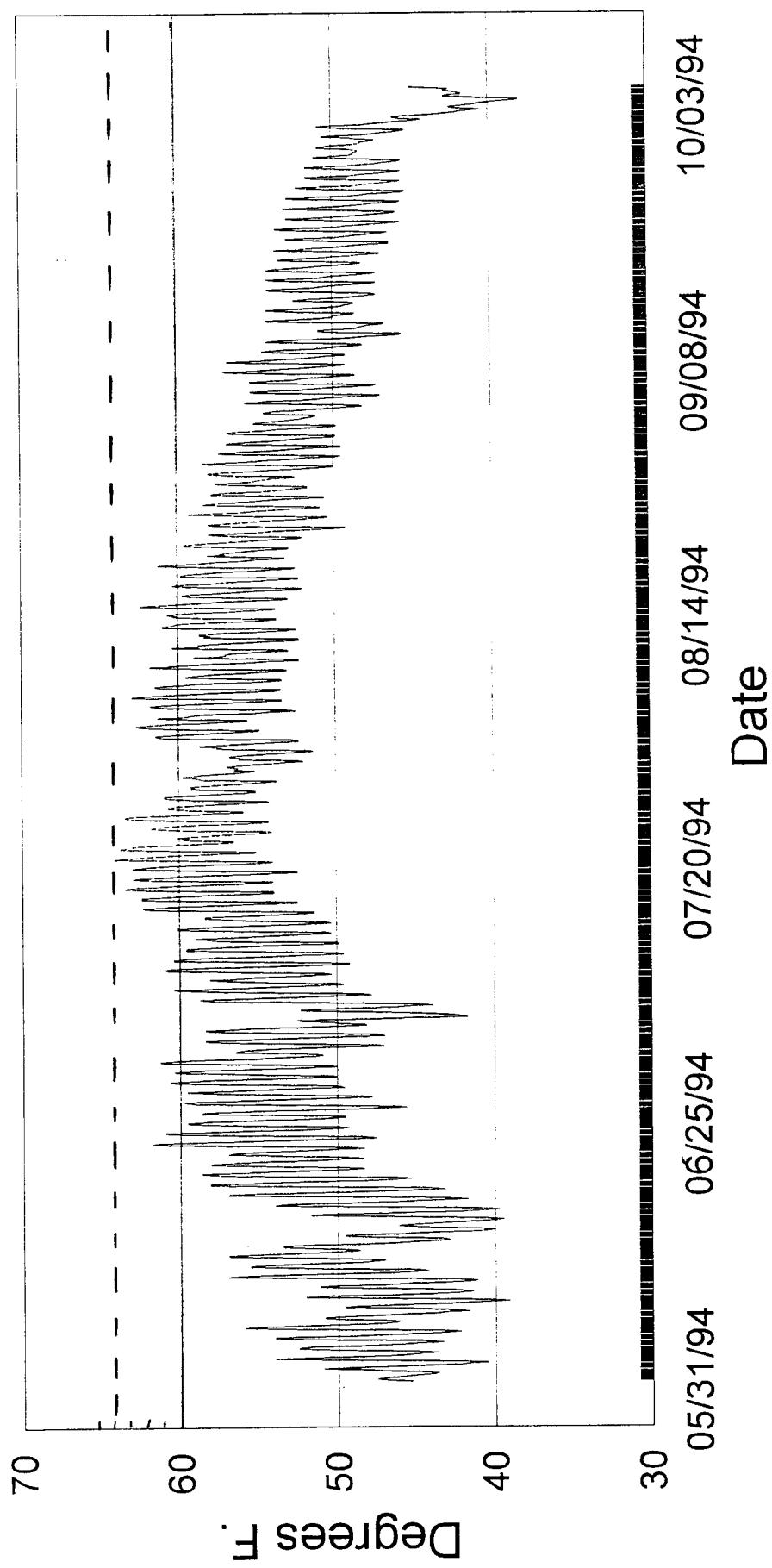
Morgan Cr.  
1994 HOBO Temperatures



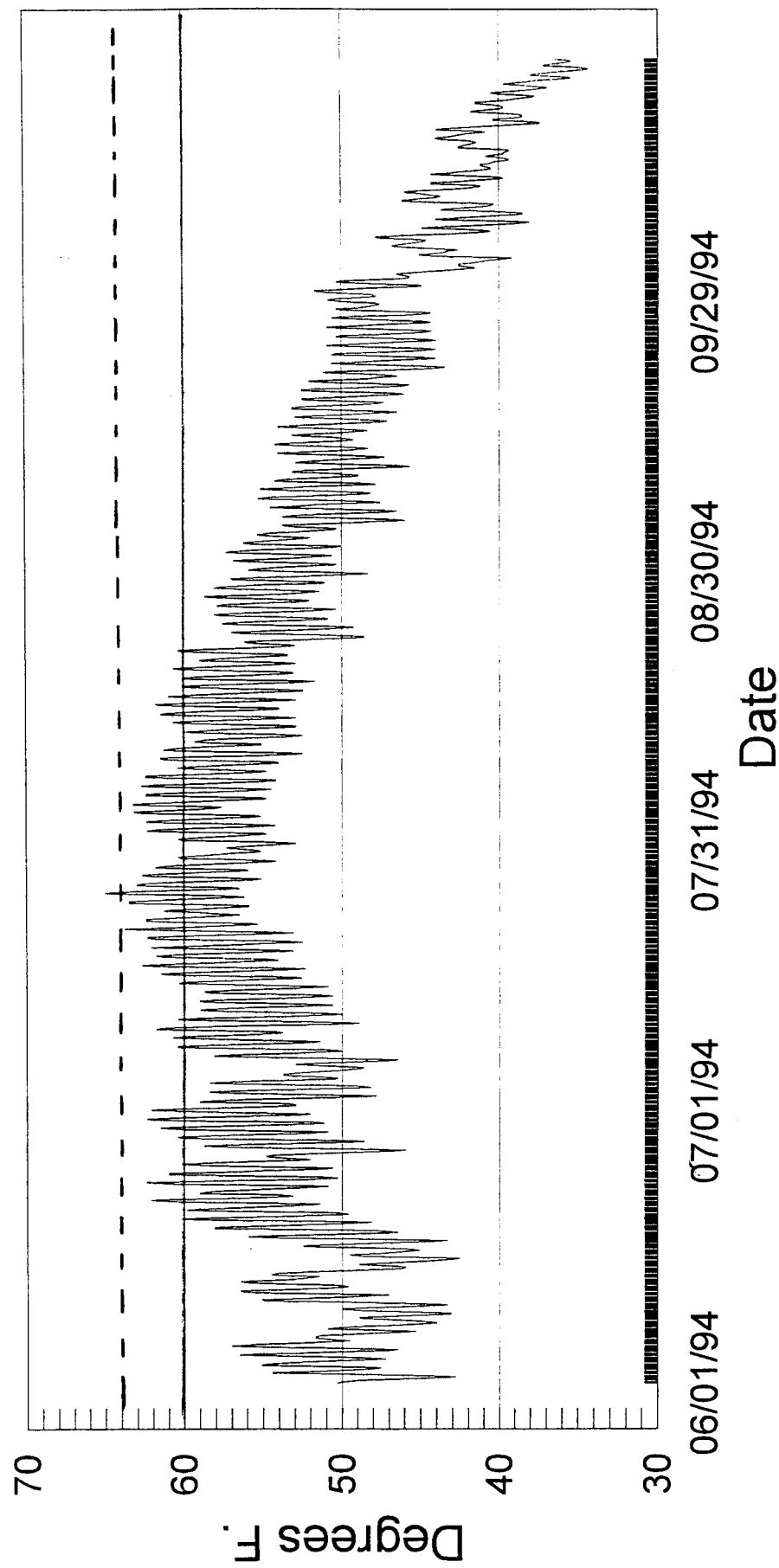
Morgan Creek  
1994 HOBO Temperatures



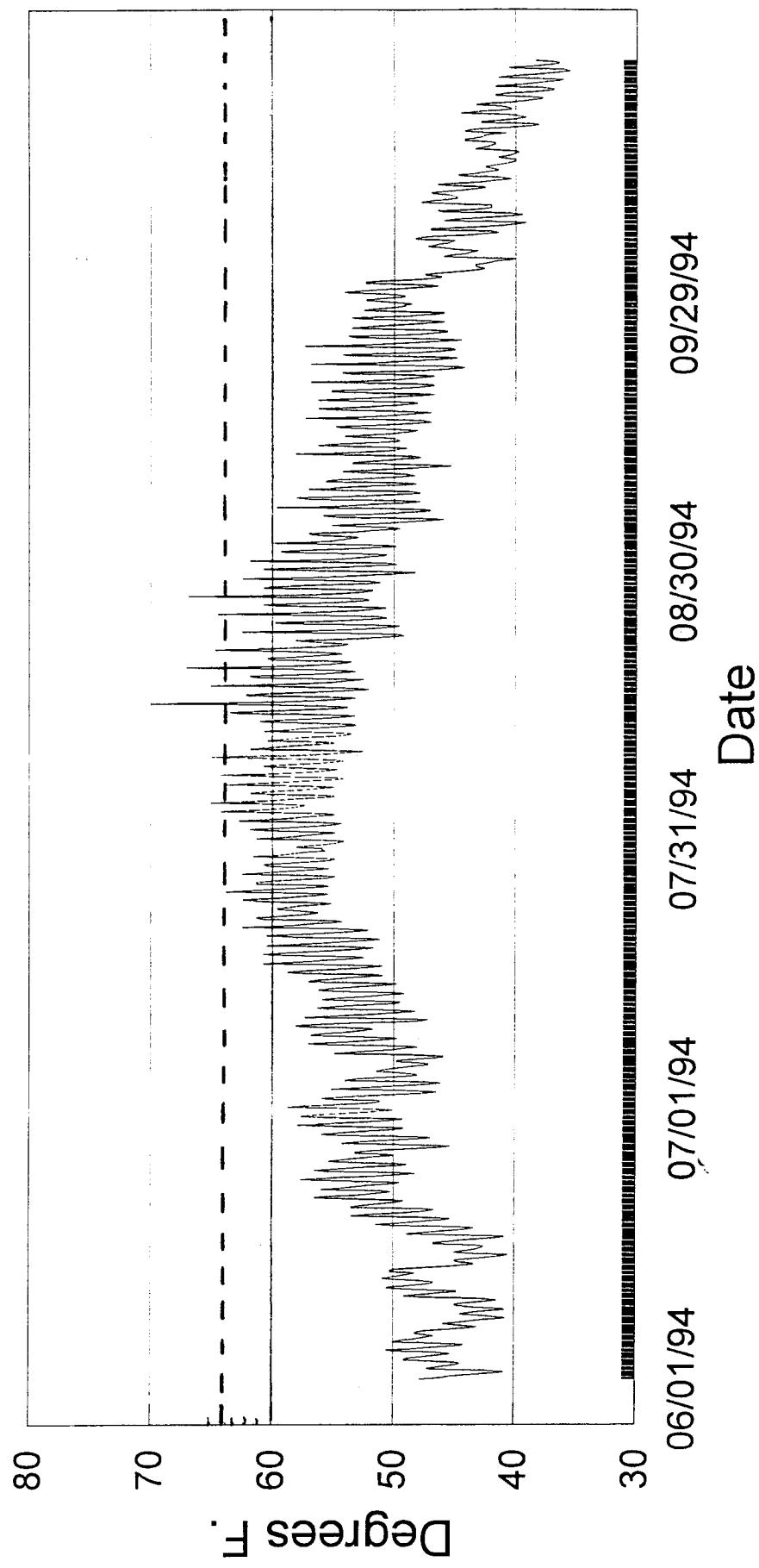
**West Fork Morgan Creek  
1994 HOBO Temperatures**



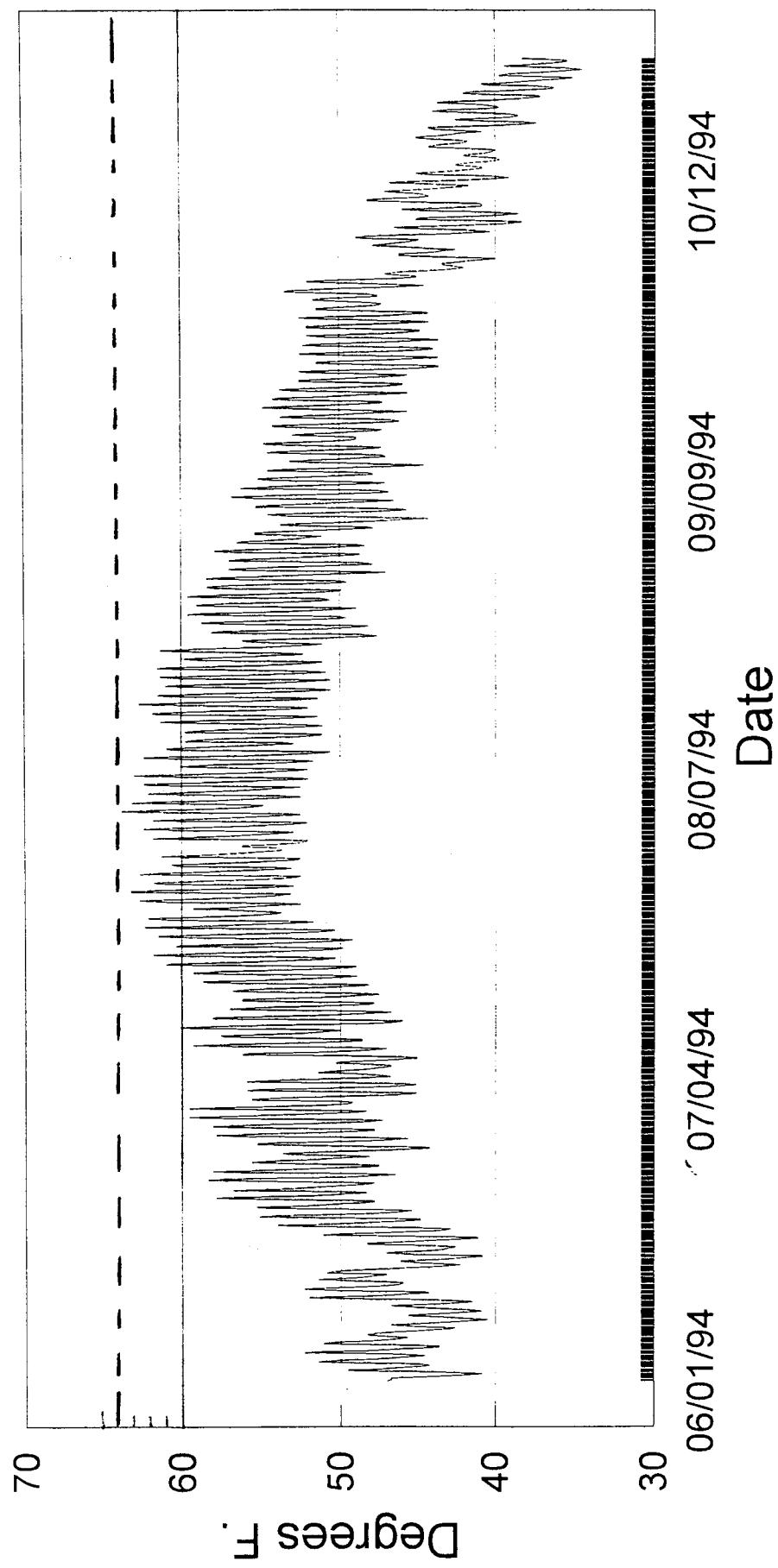
Dahlonega Creek  
1994 HOBO Temperatures



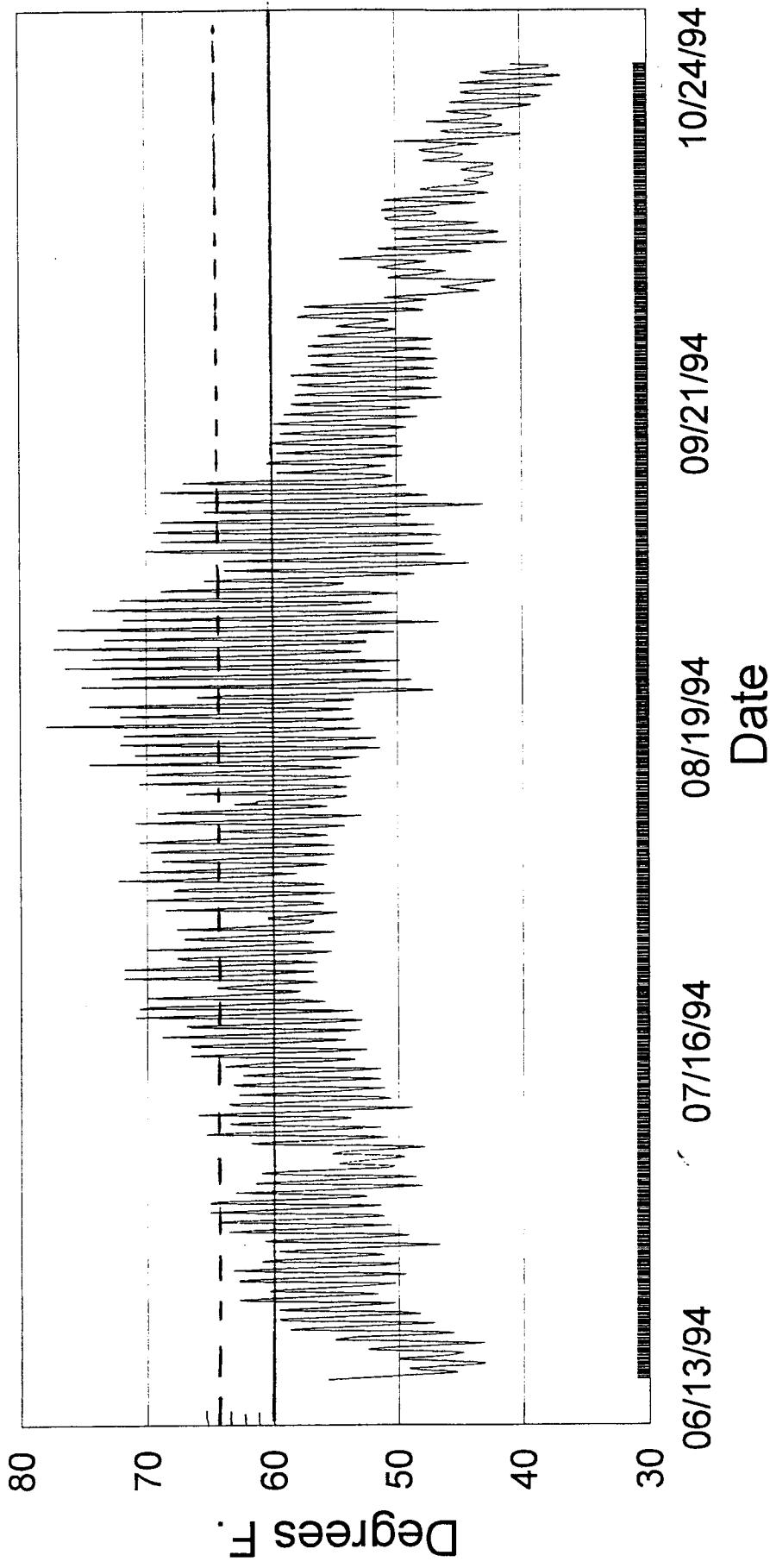
**Ditch Creek**  
**1994 HOBO Temperatures**



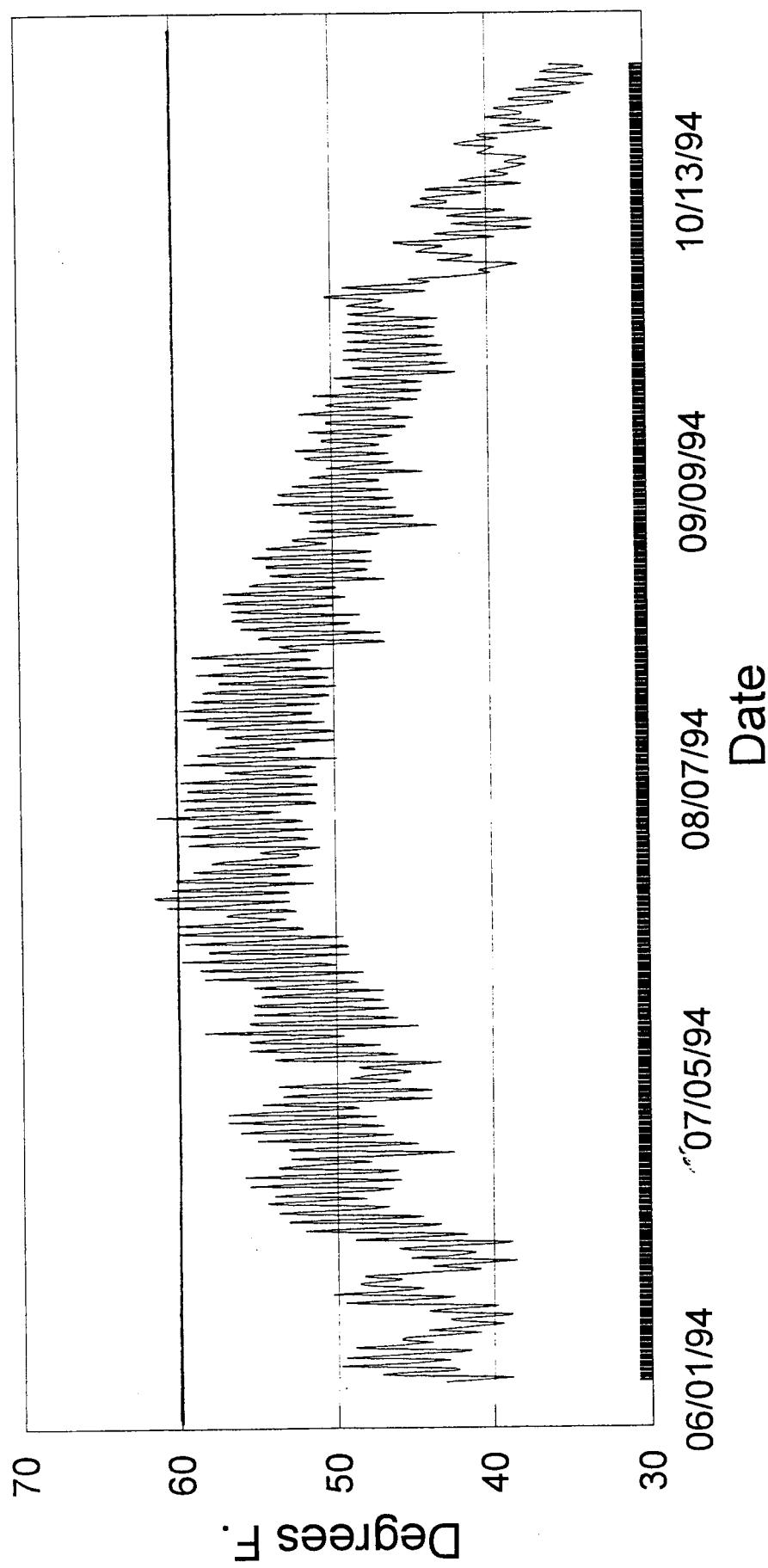
## Hughes Creek 1994 HOBO Temperatures



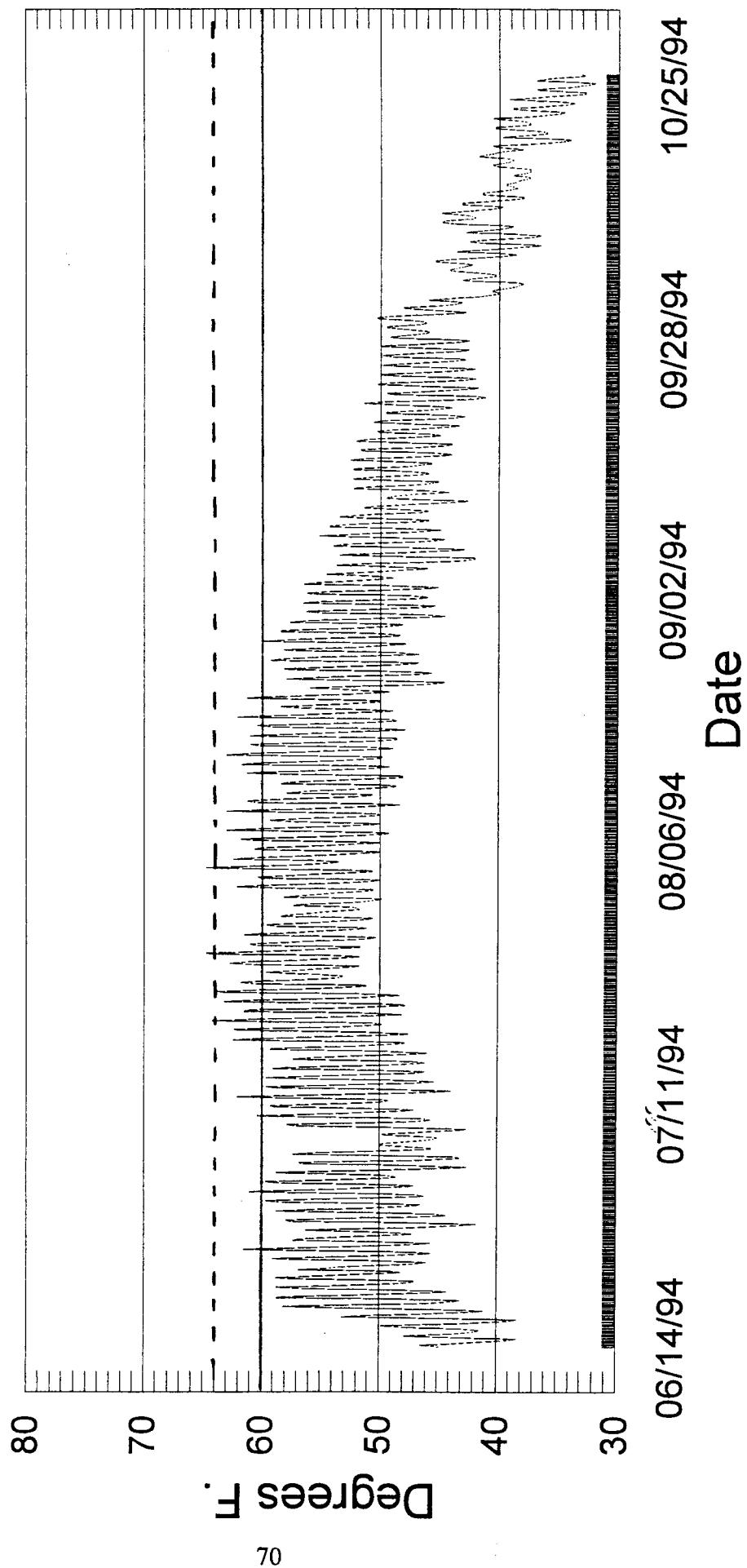
**North Fork Salmon River above Mouth  
1994 HOBO Temperatures**



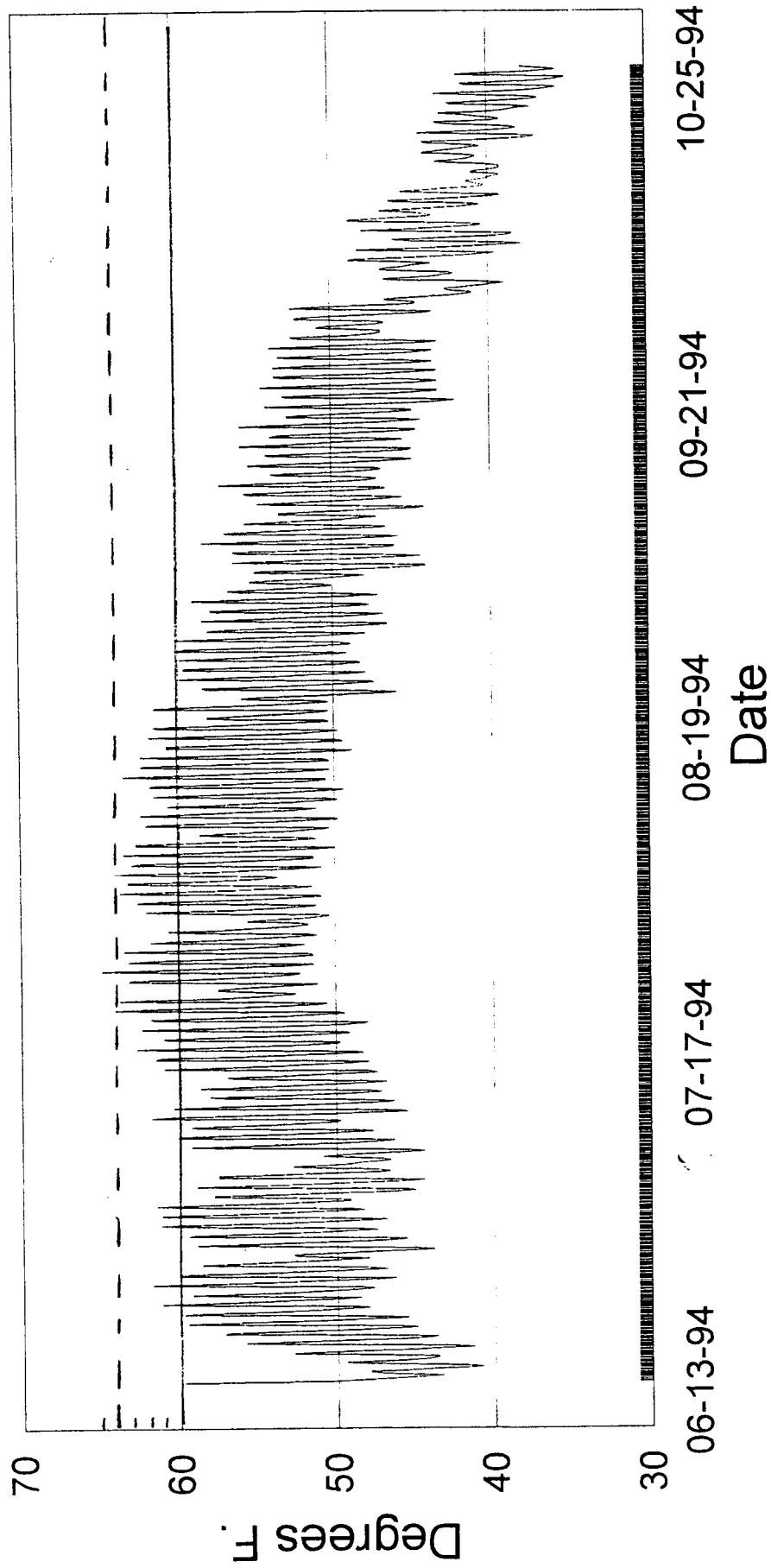
**North Fork Salmon River at Crone Gulch  
1994 HOBO Temperatures**

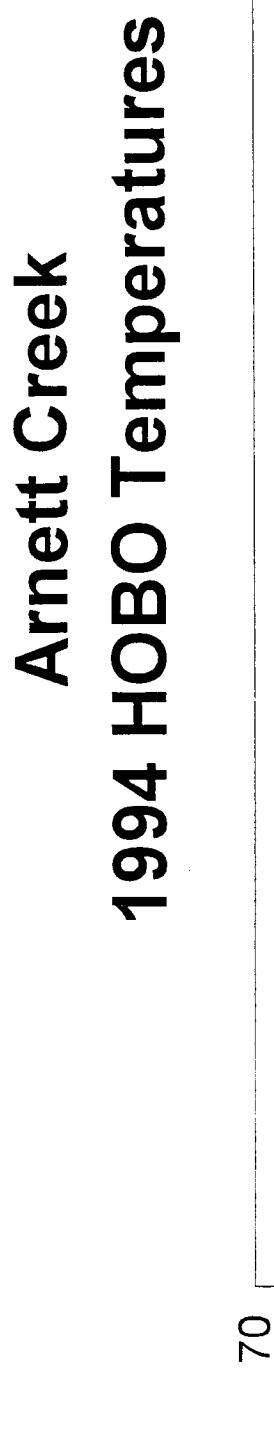


Pierce Creek  
1994 HOBO Temperatures

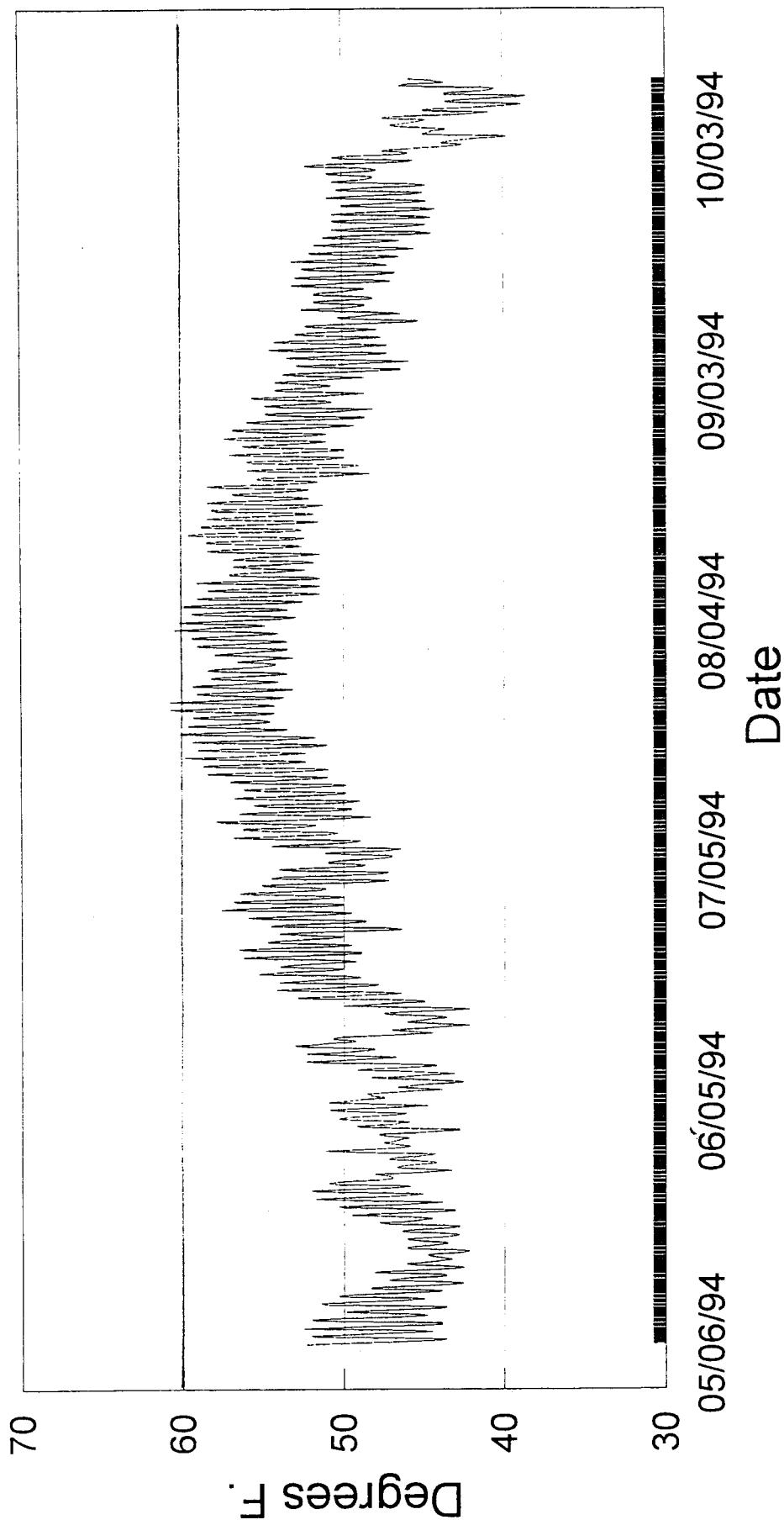


**Threemile Creek  
1994 HOBO Temperatures**

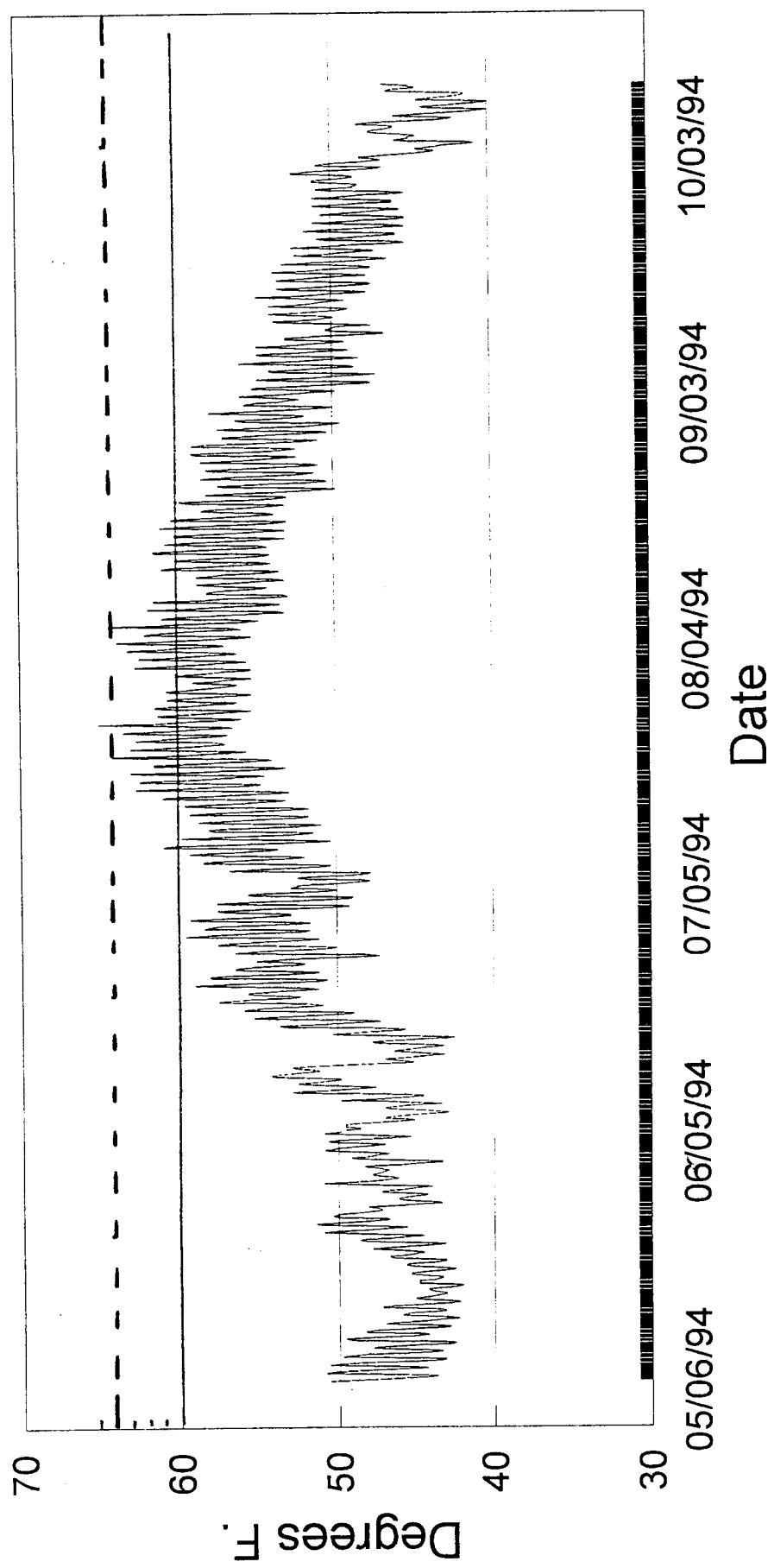




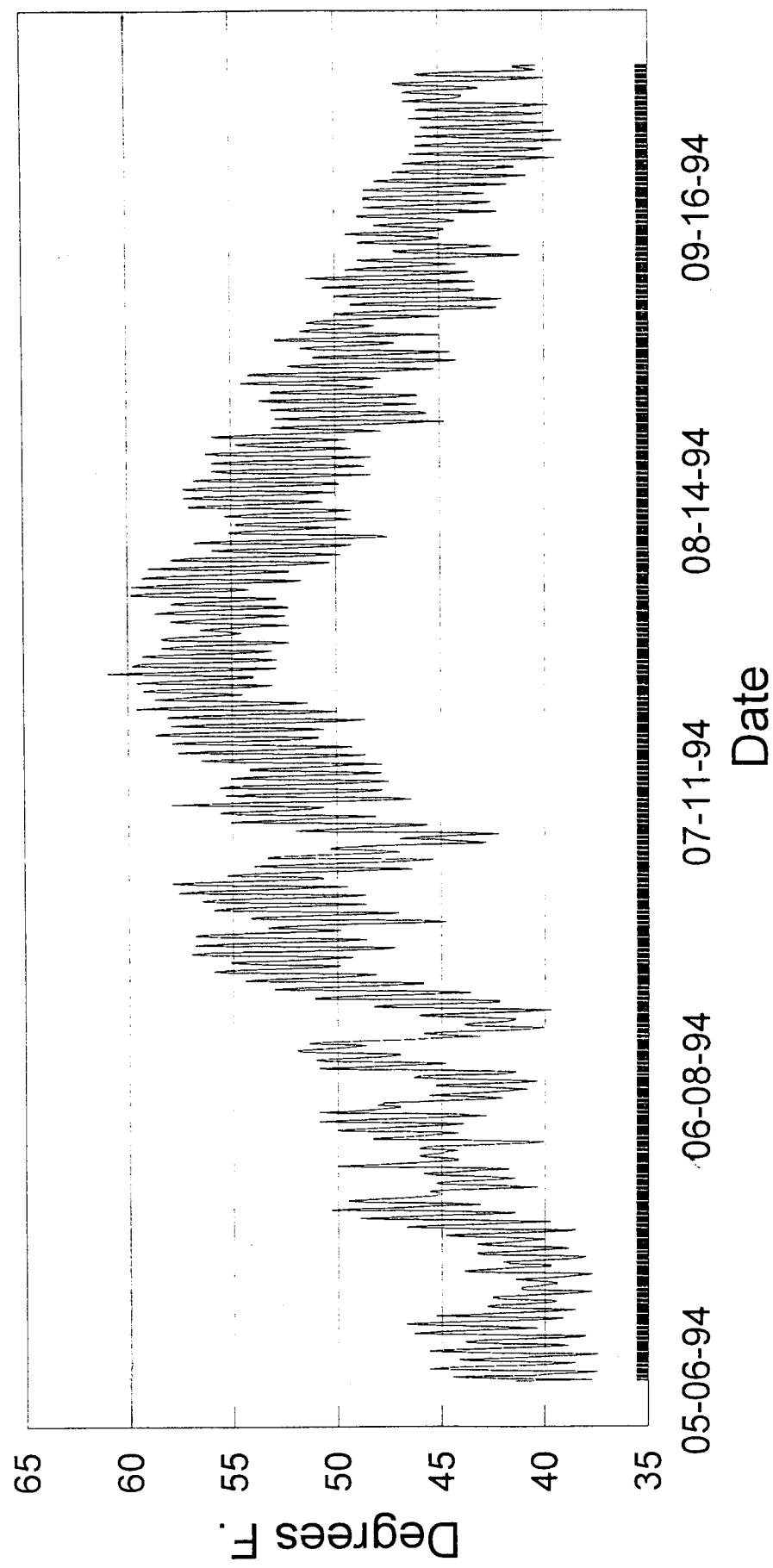
**Beaver Creek**  
**1994 HOBO Temperatures**



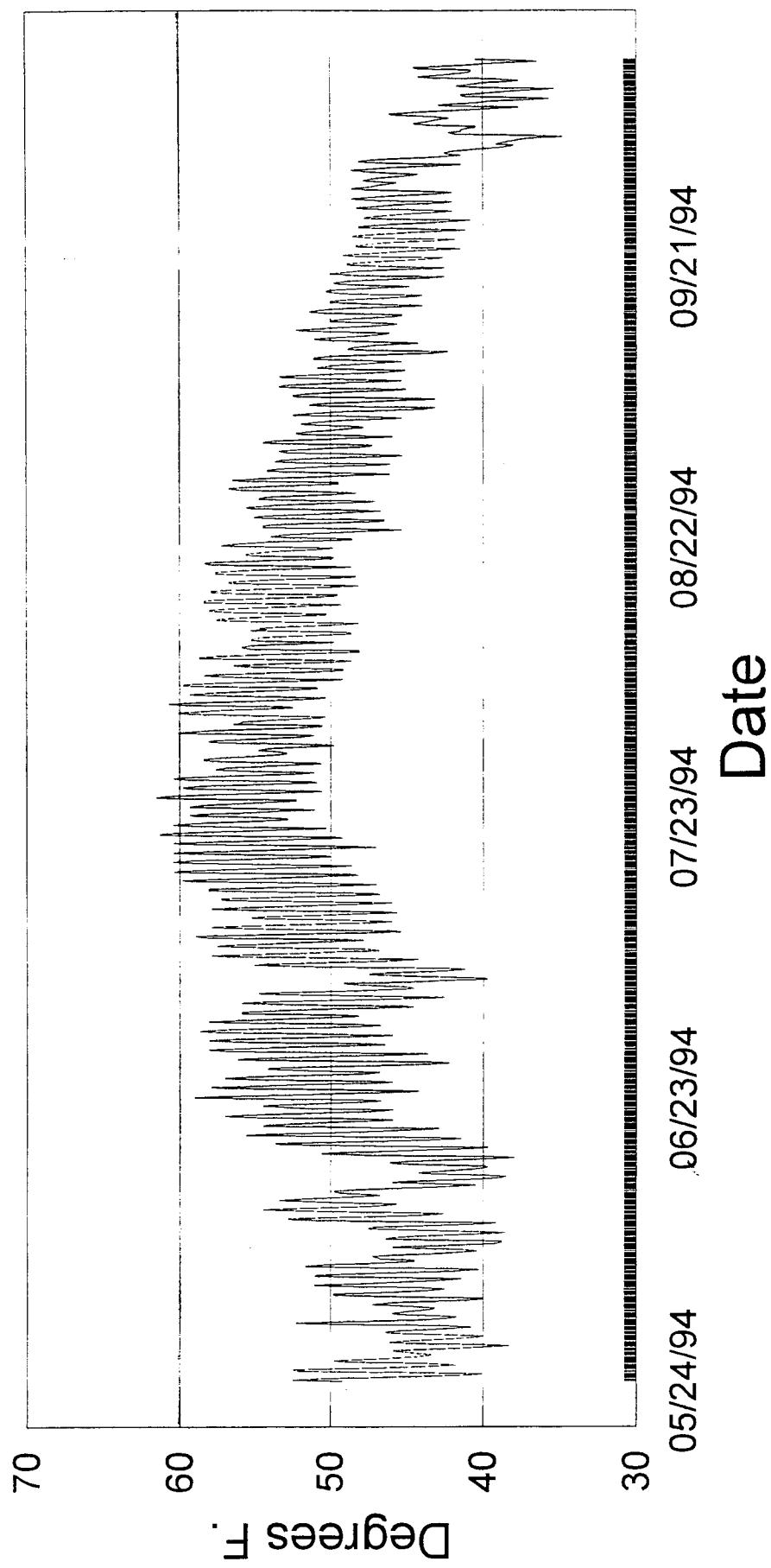
**Clear Cr.  
1994 HOBO Temperatures**



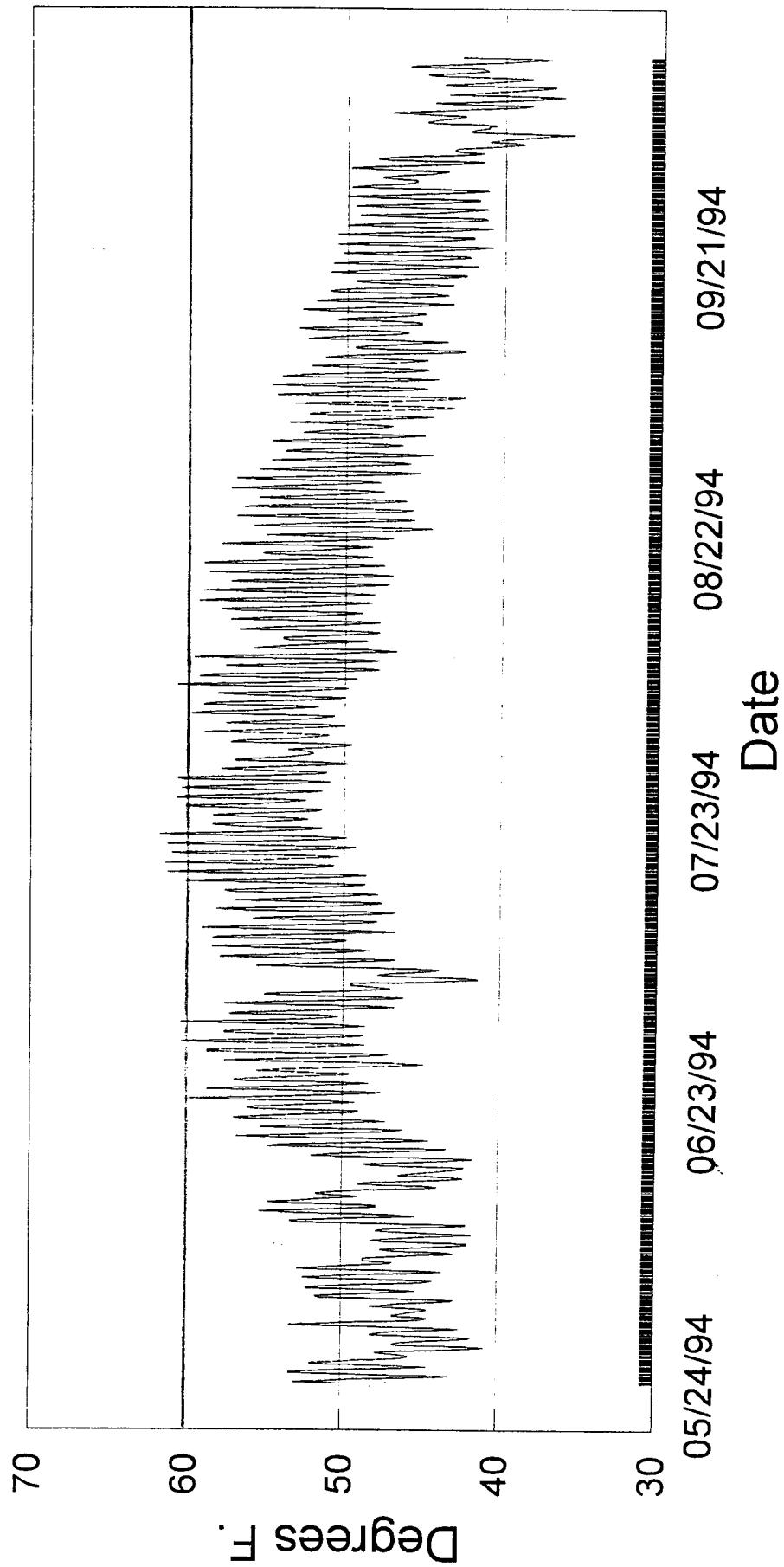
Moccasin Creek  
1994 HOBO Temperatures



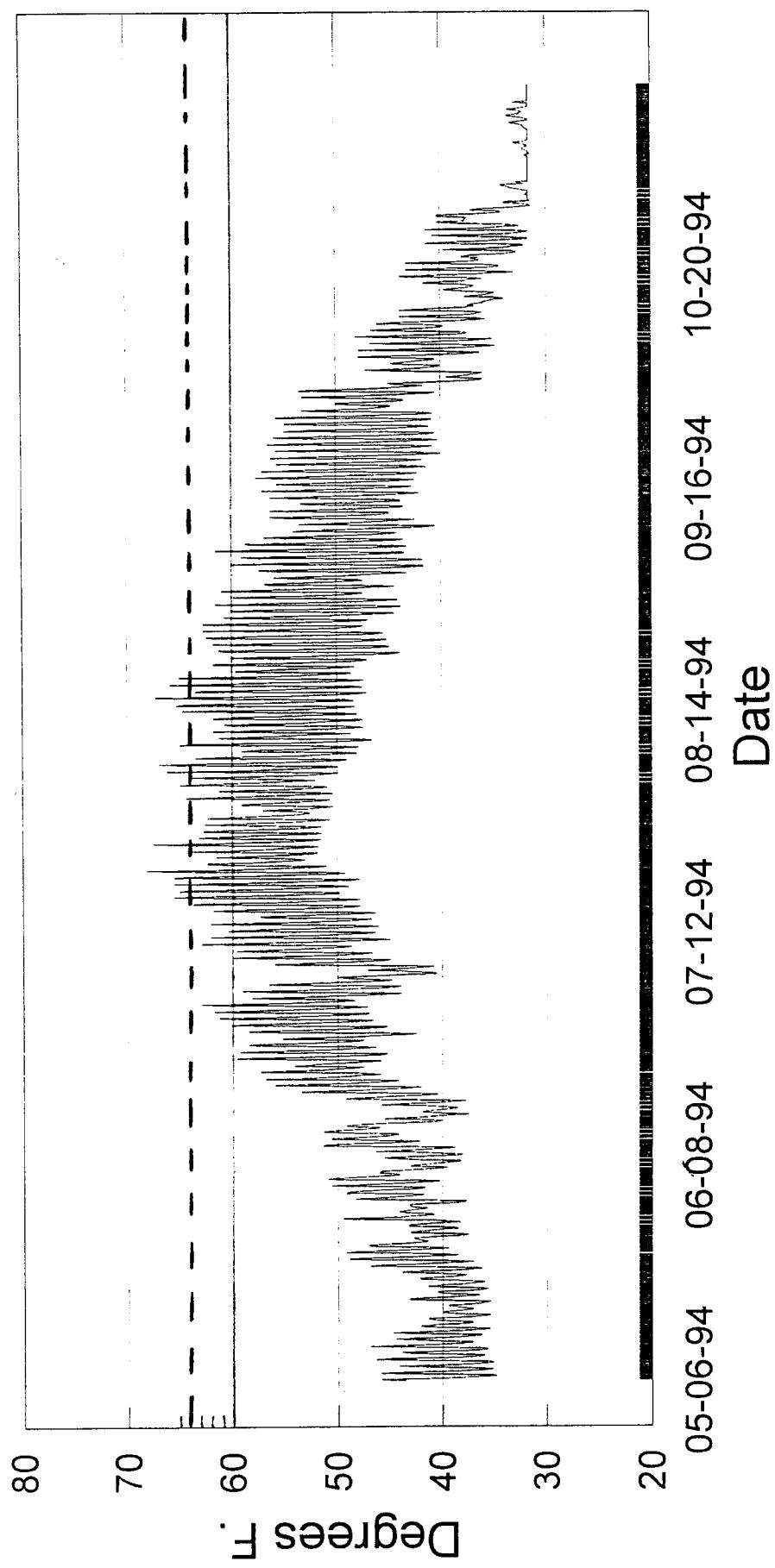
**Moyer Creek**  
**1994 HOBO Temperatures**



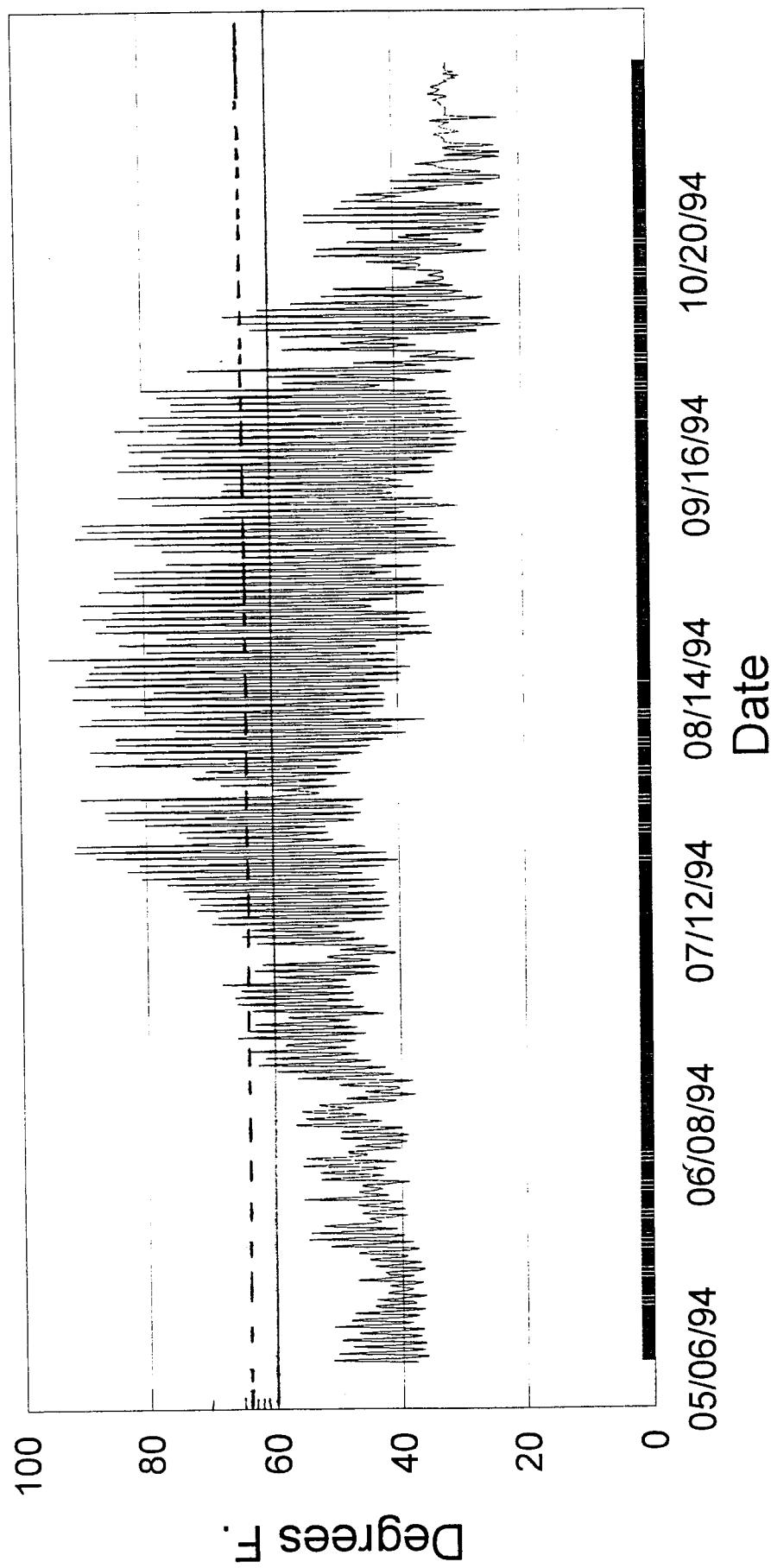
**Musgrove Creek**  
**1994 HOBO Temperatures**



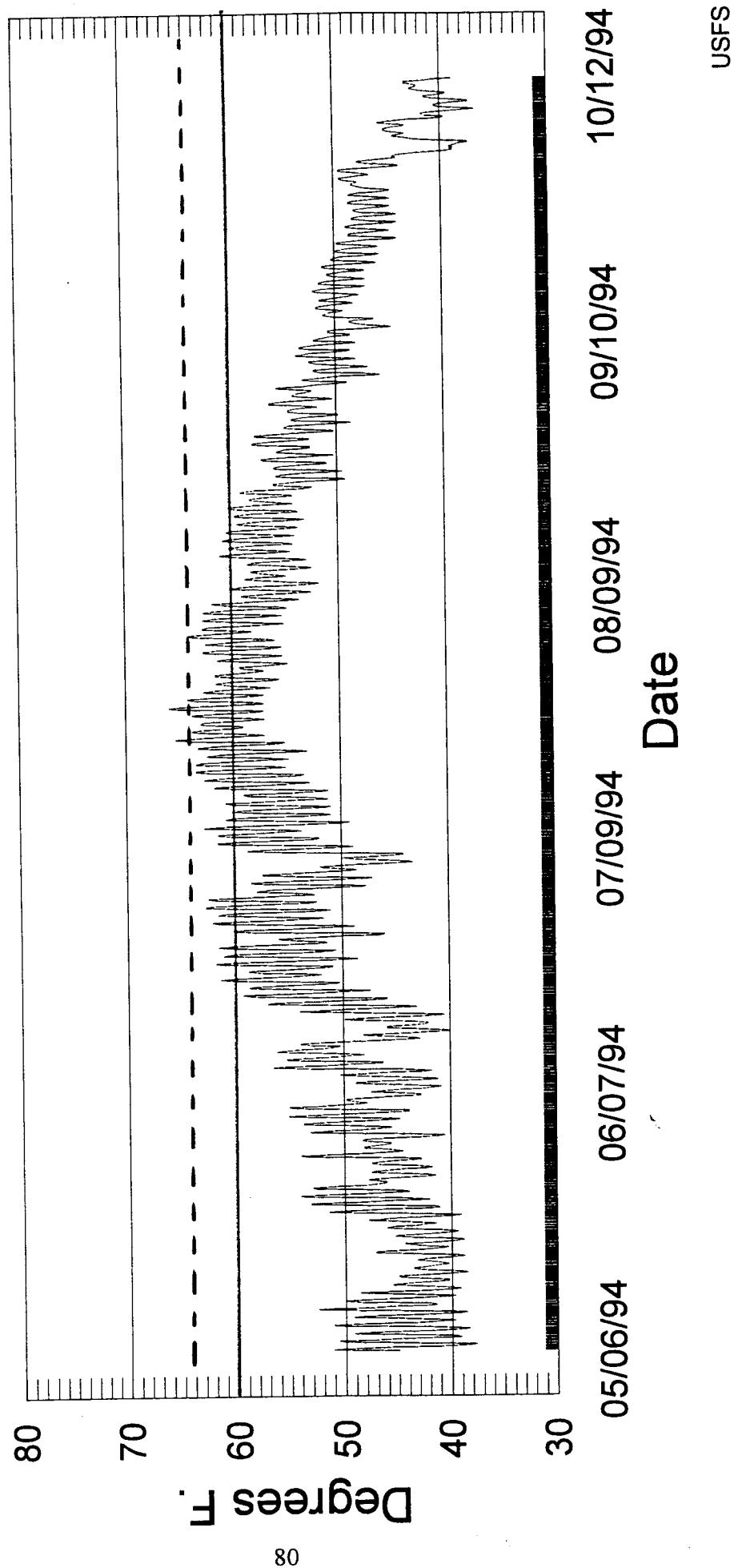
**Napias Creek above Arnett Creek  
1994 HOBO Temperatures**



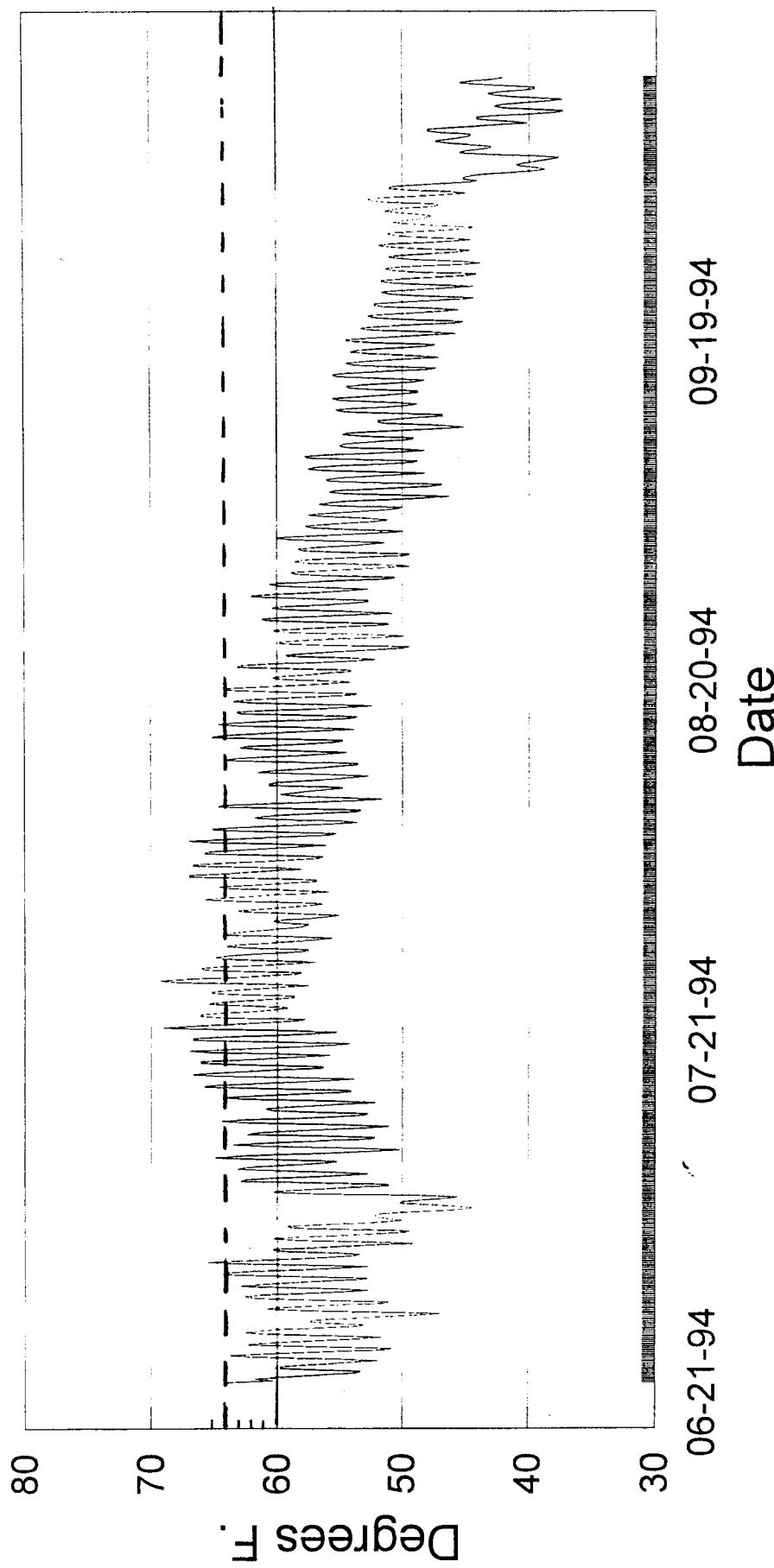
Napias Creek between Phelan & Moccasin  
1994 HOBO Temperatures



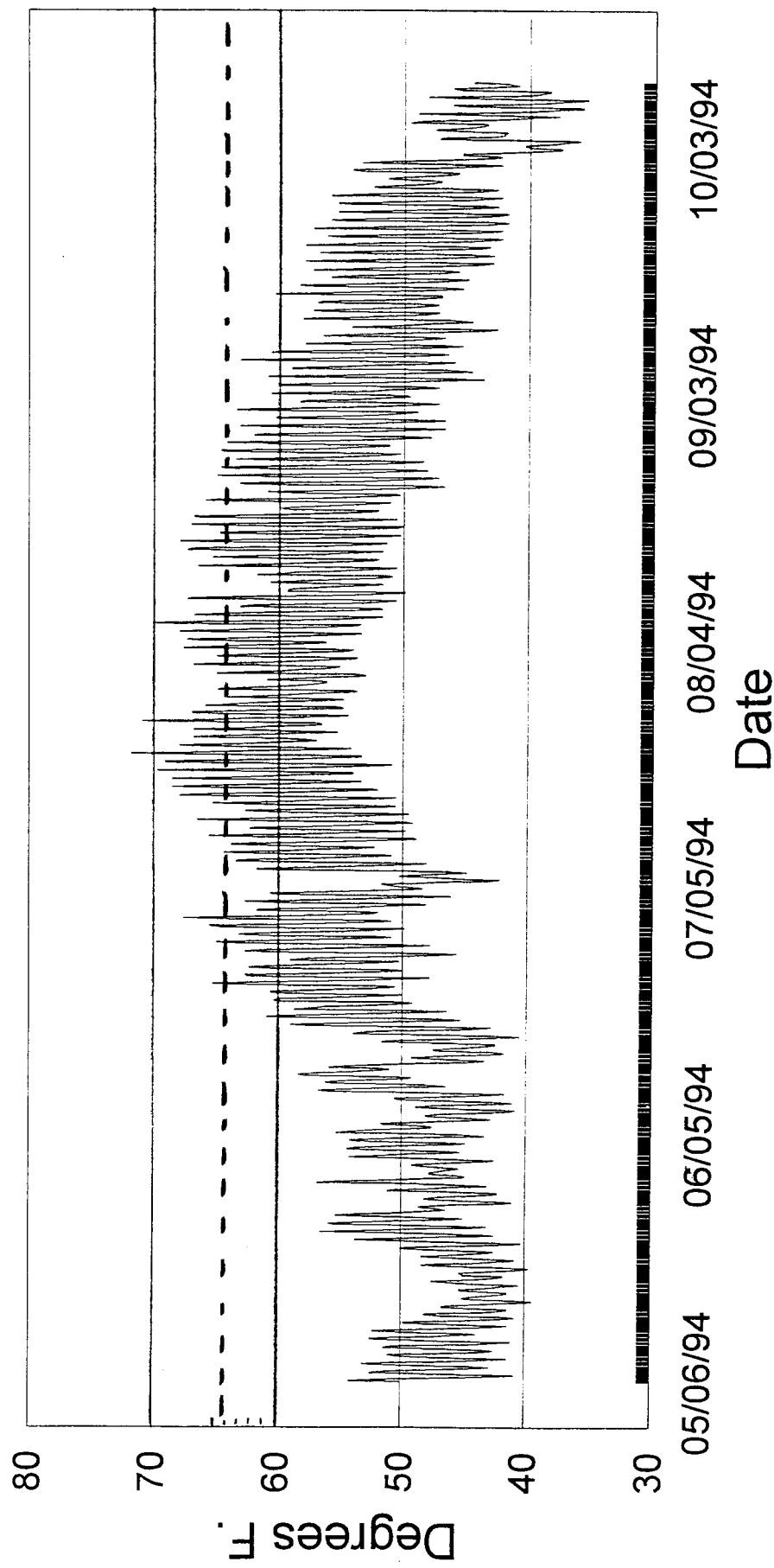
Napias Creek near Mouth  
1994 HOBO Temperatures



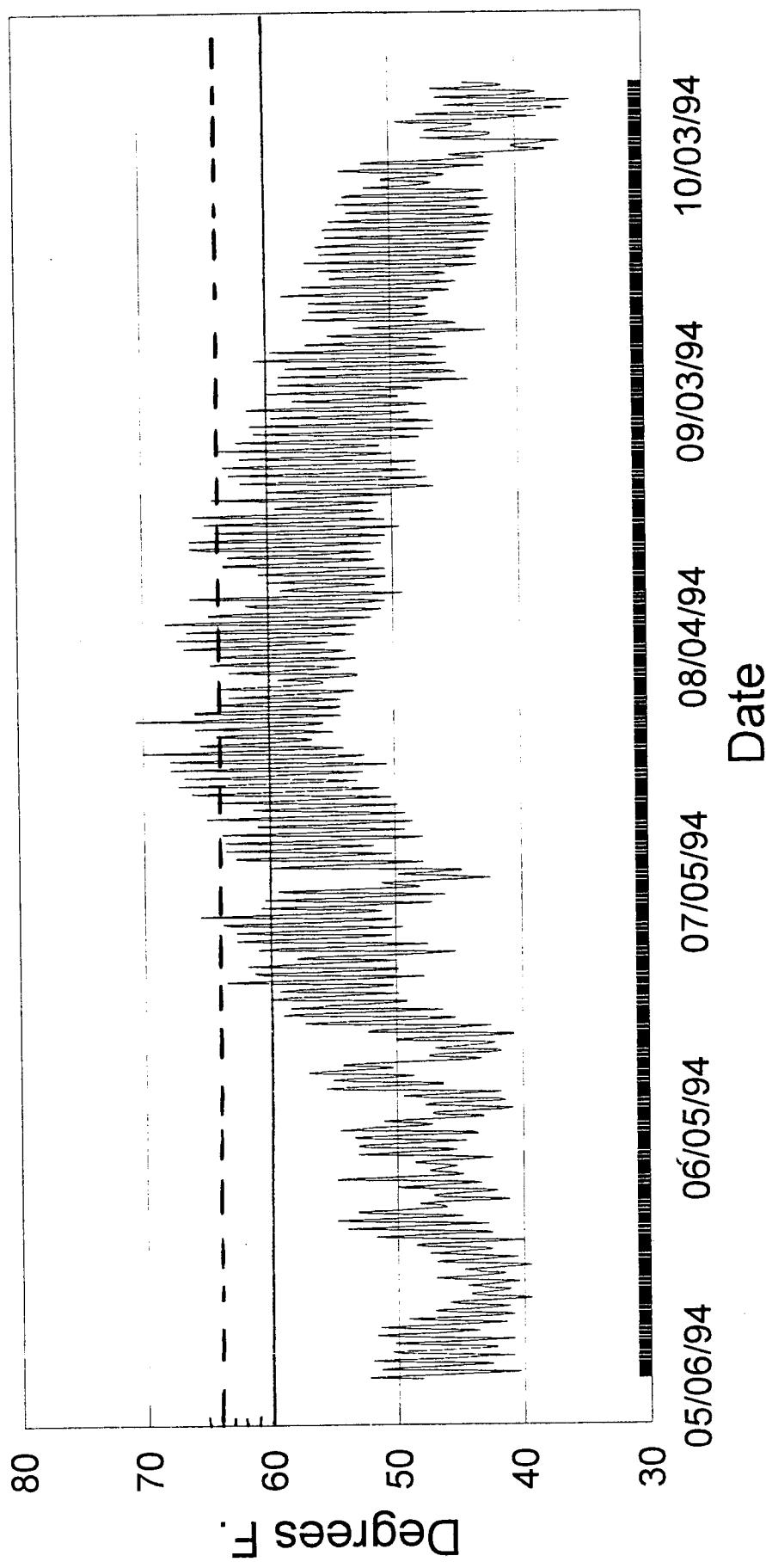
Panther Creek above Big Jureano  
1994 HOBO Temperatures



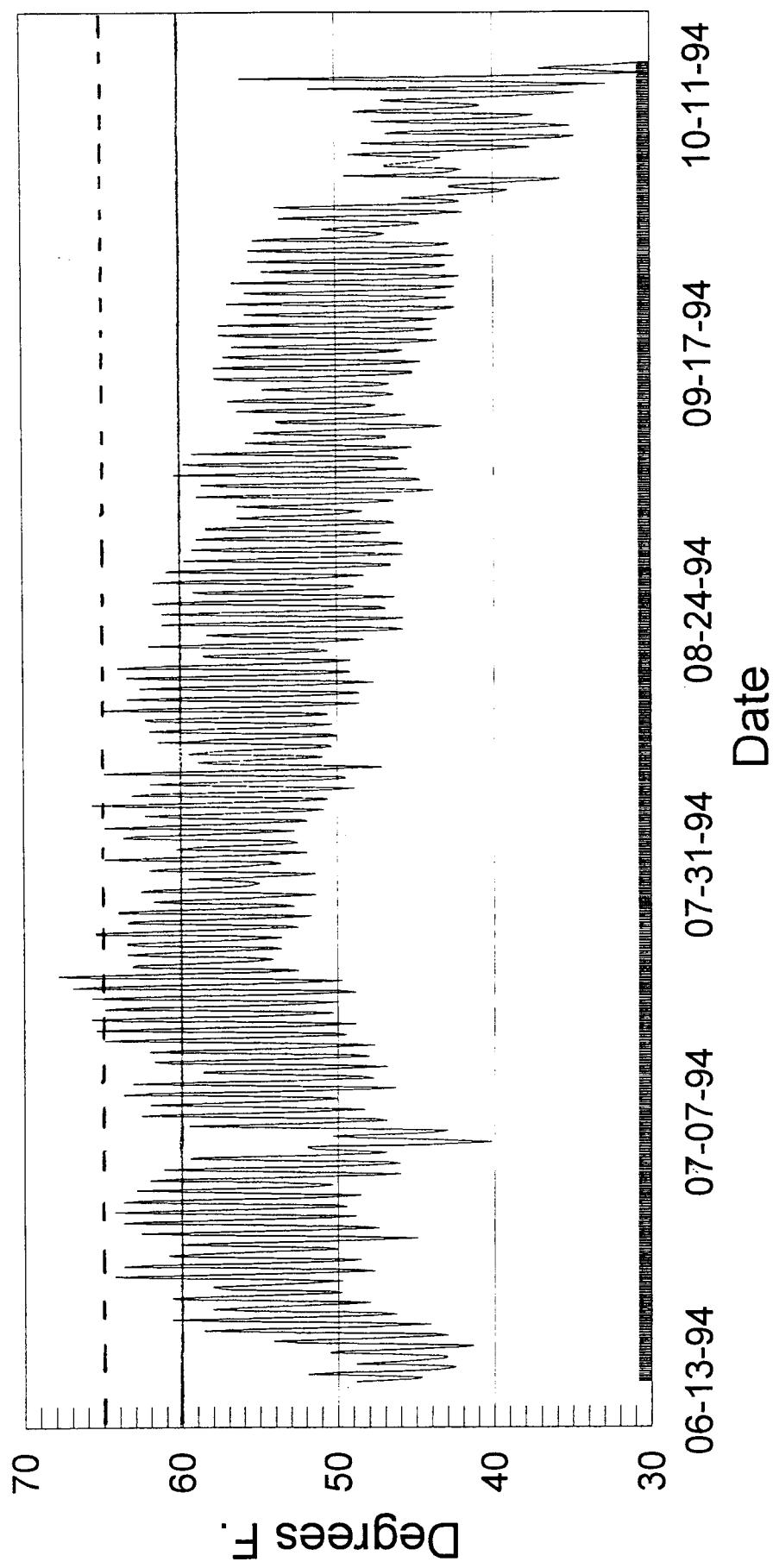
Panther above Deep Creek  
1994 HOBO Temperatures



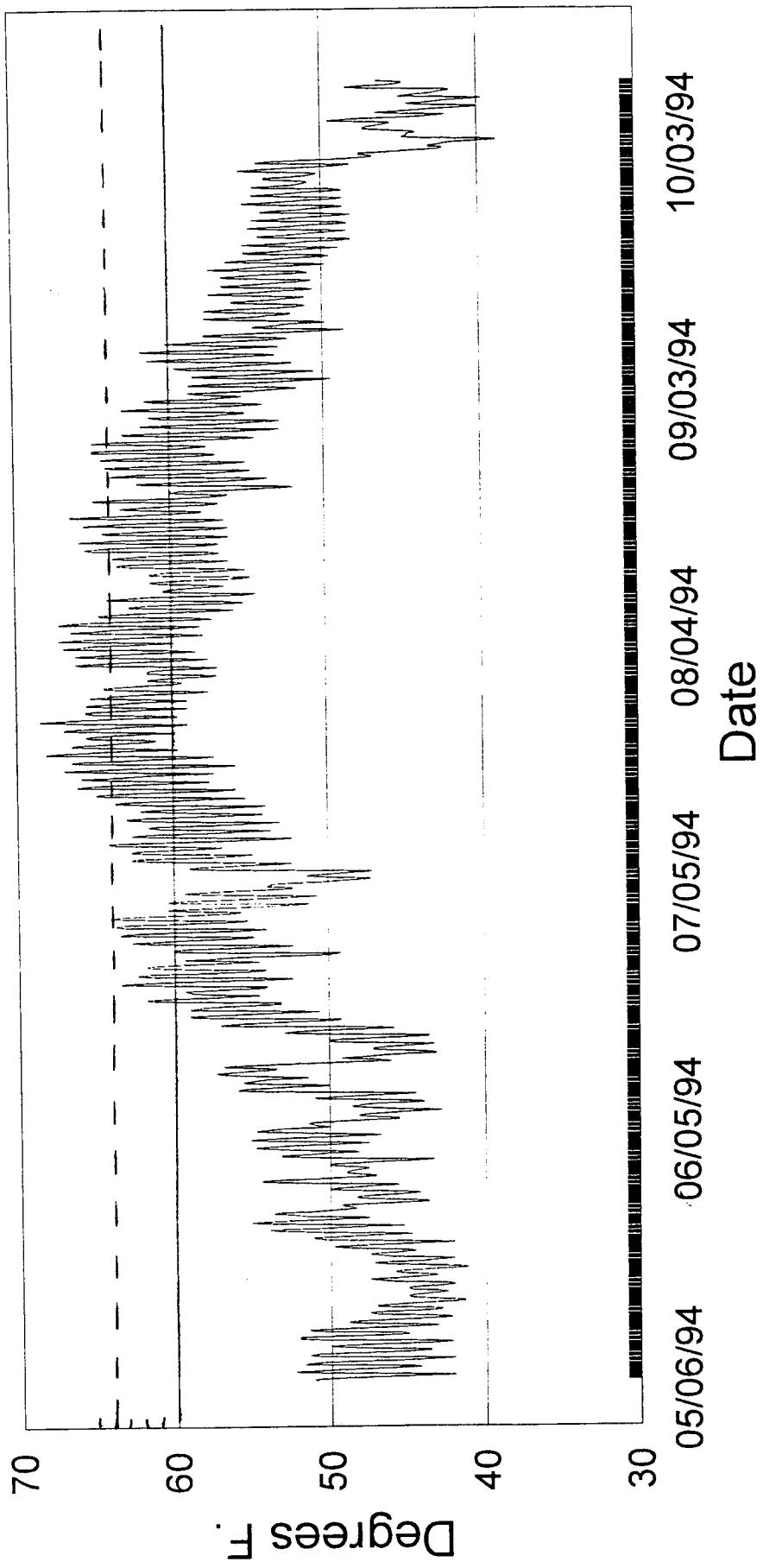
**Panther Creek above Napias Creek**  
**1994 HOBO Temperatures**



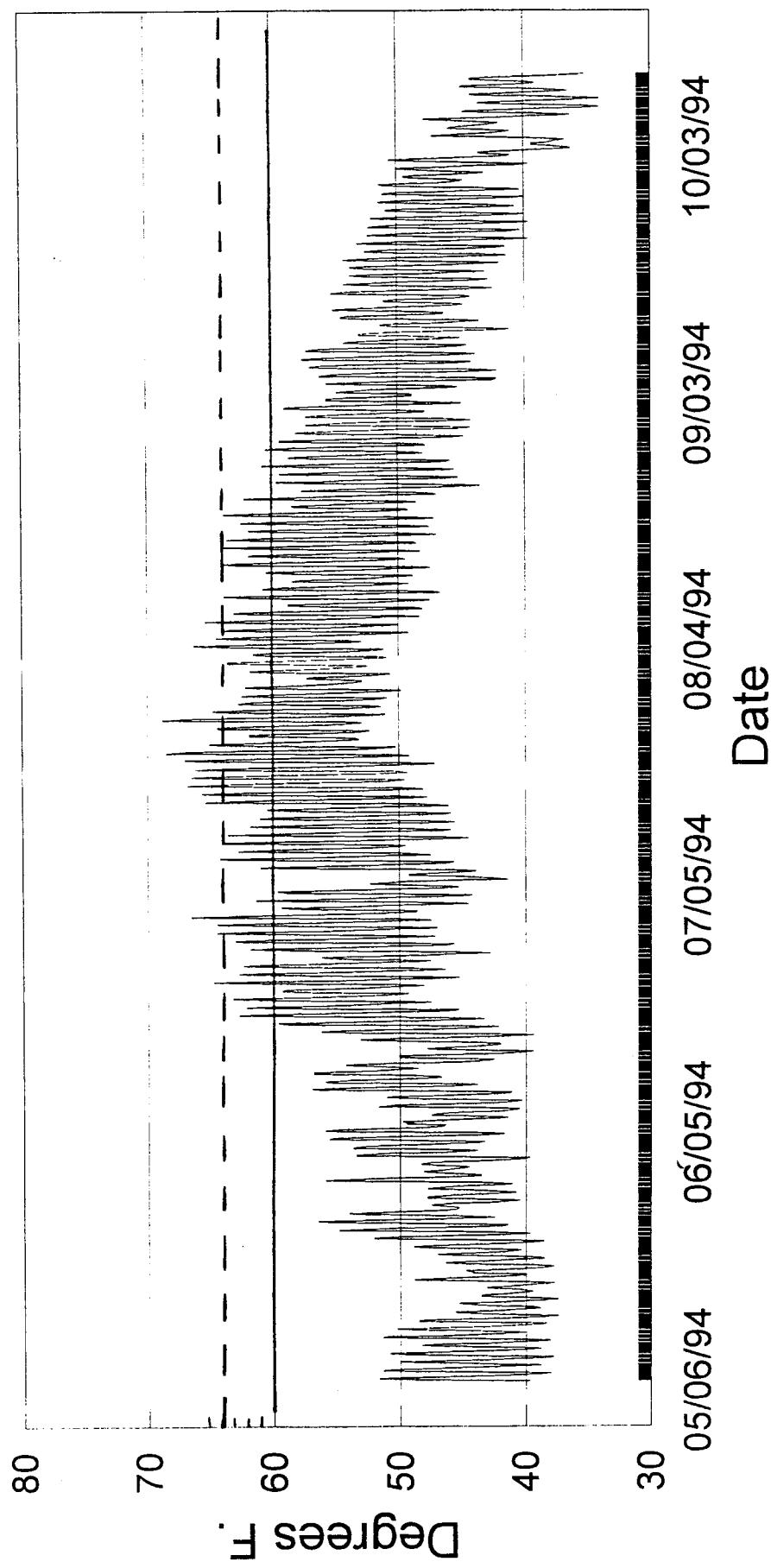
**Panther Creek above Porphyry Creek  
1994 HOBO Temperatures**



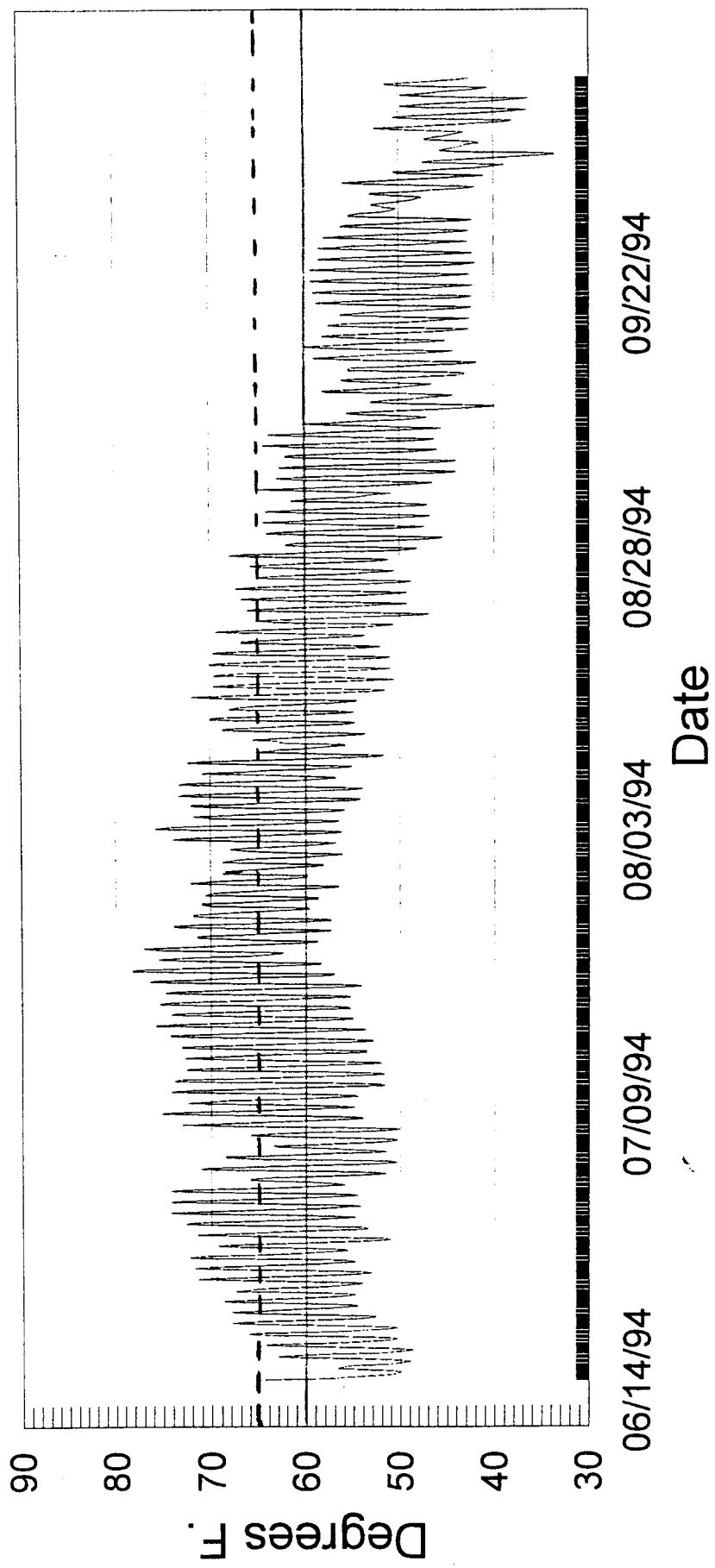
Panther Creek at Fritzer Gulch  
1994 HOBO Temperatures



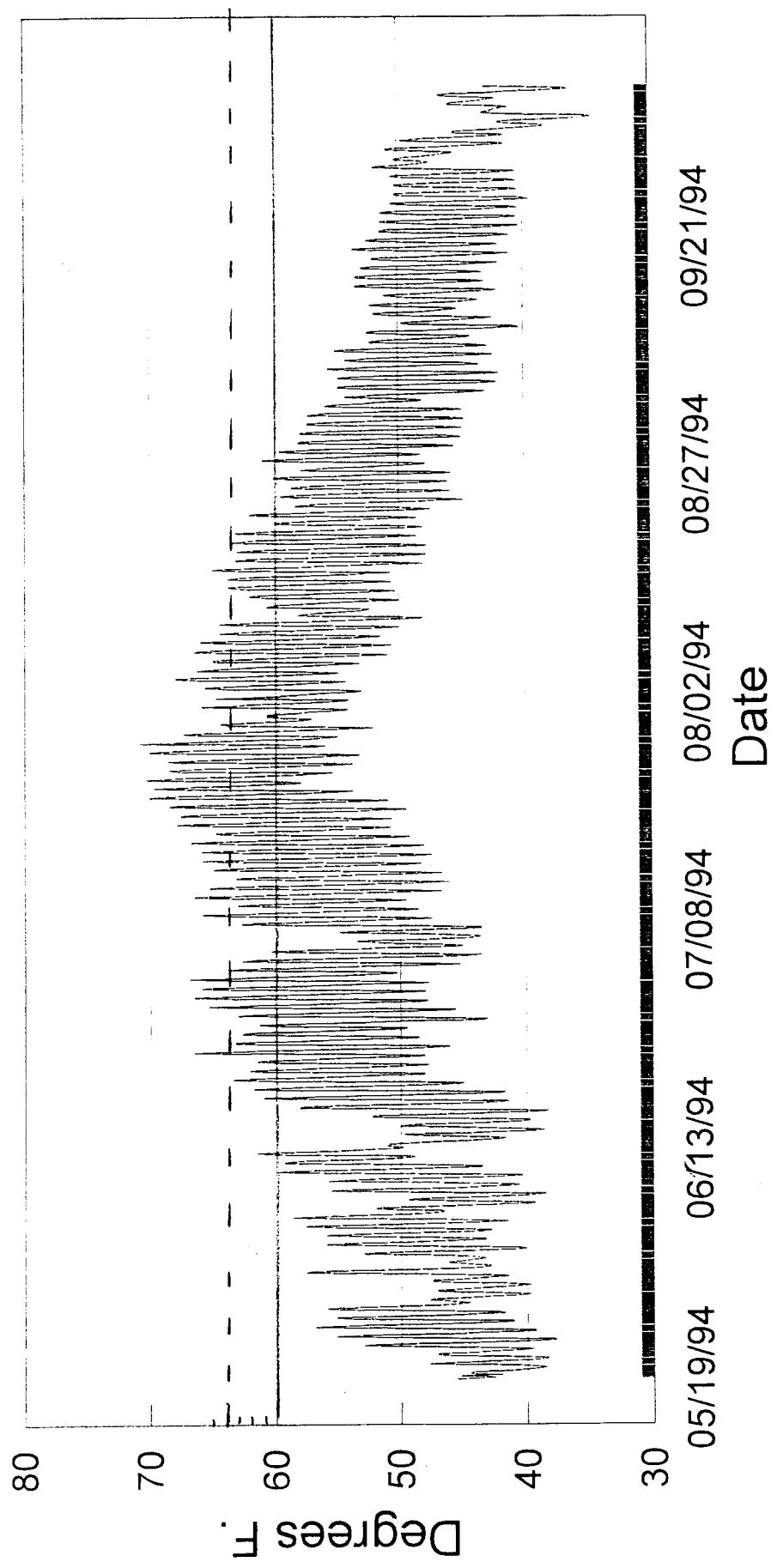
**Phelan Creek**  
**1994 HOBO Temperatures**



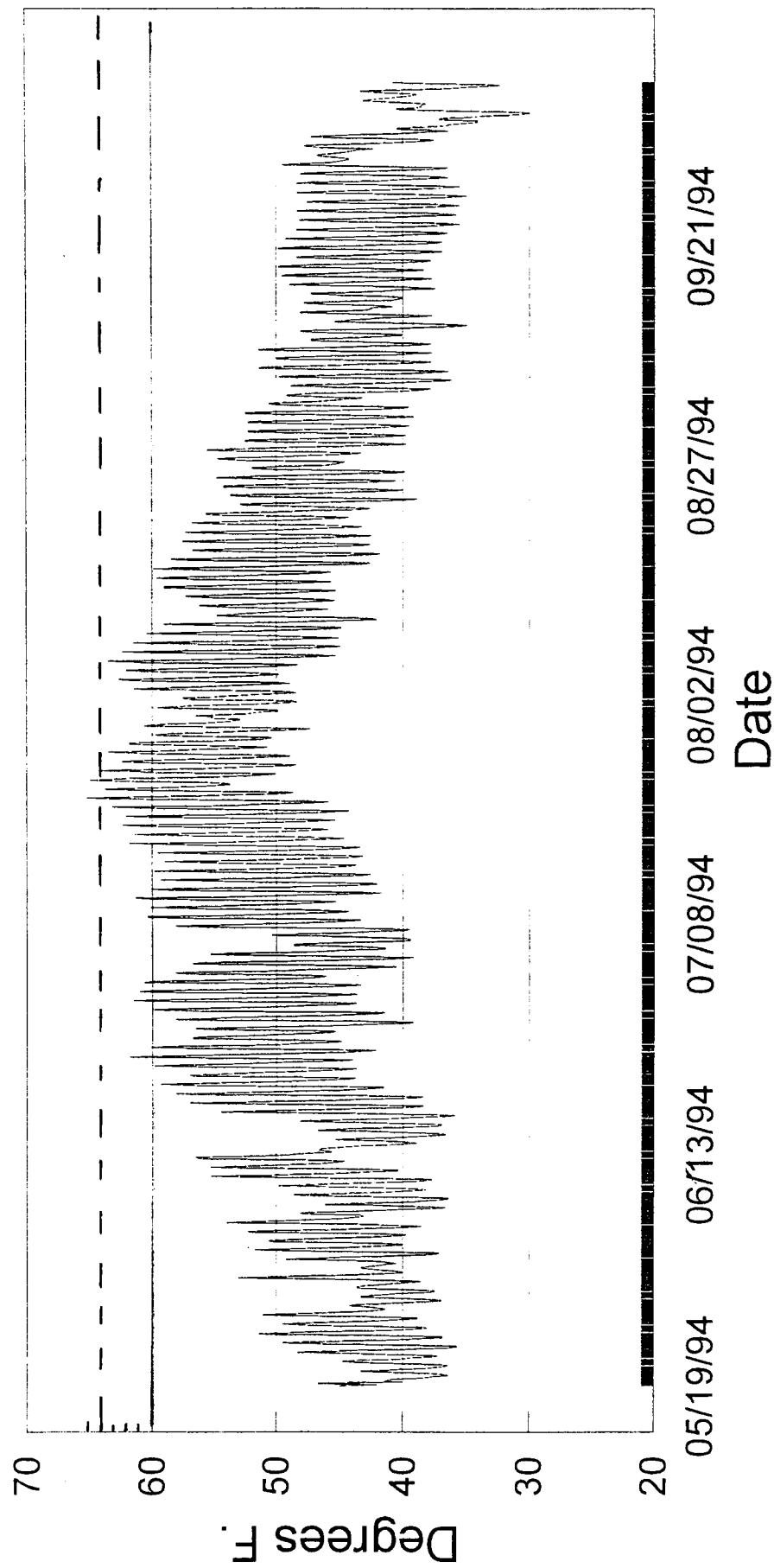
**Alturas Lake Creek below Cabin Ck. Road Bridge**  
**1994 HOBO Temperatures**



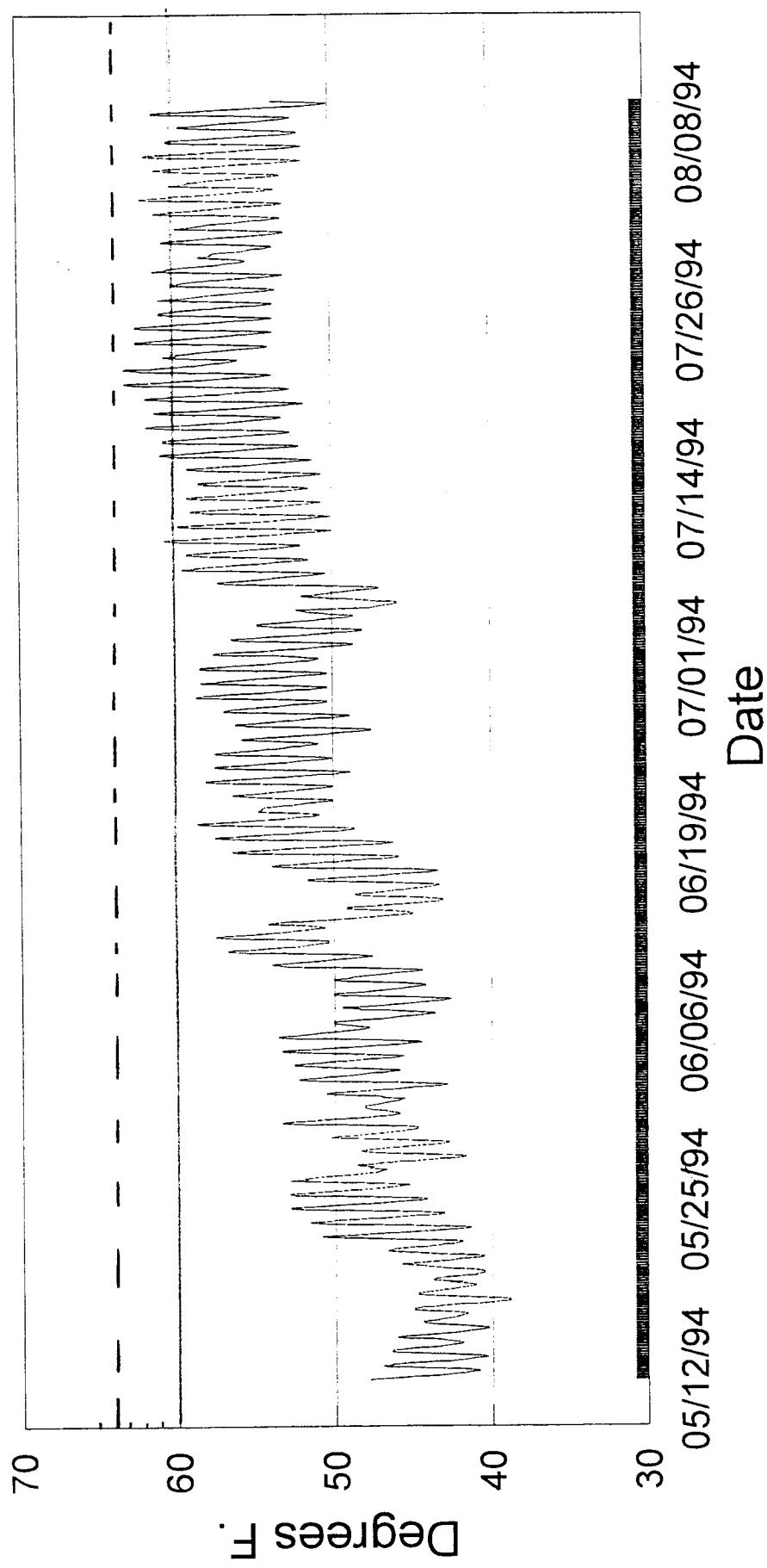
**Lower Basin Creek  
1994 HOBO Temperatures**



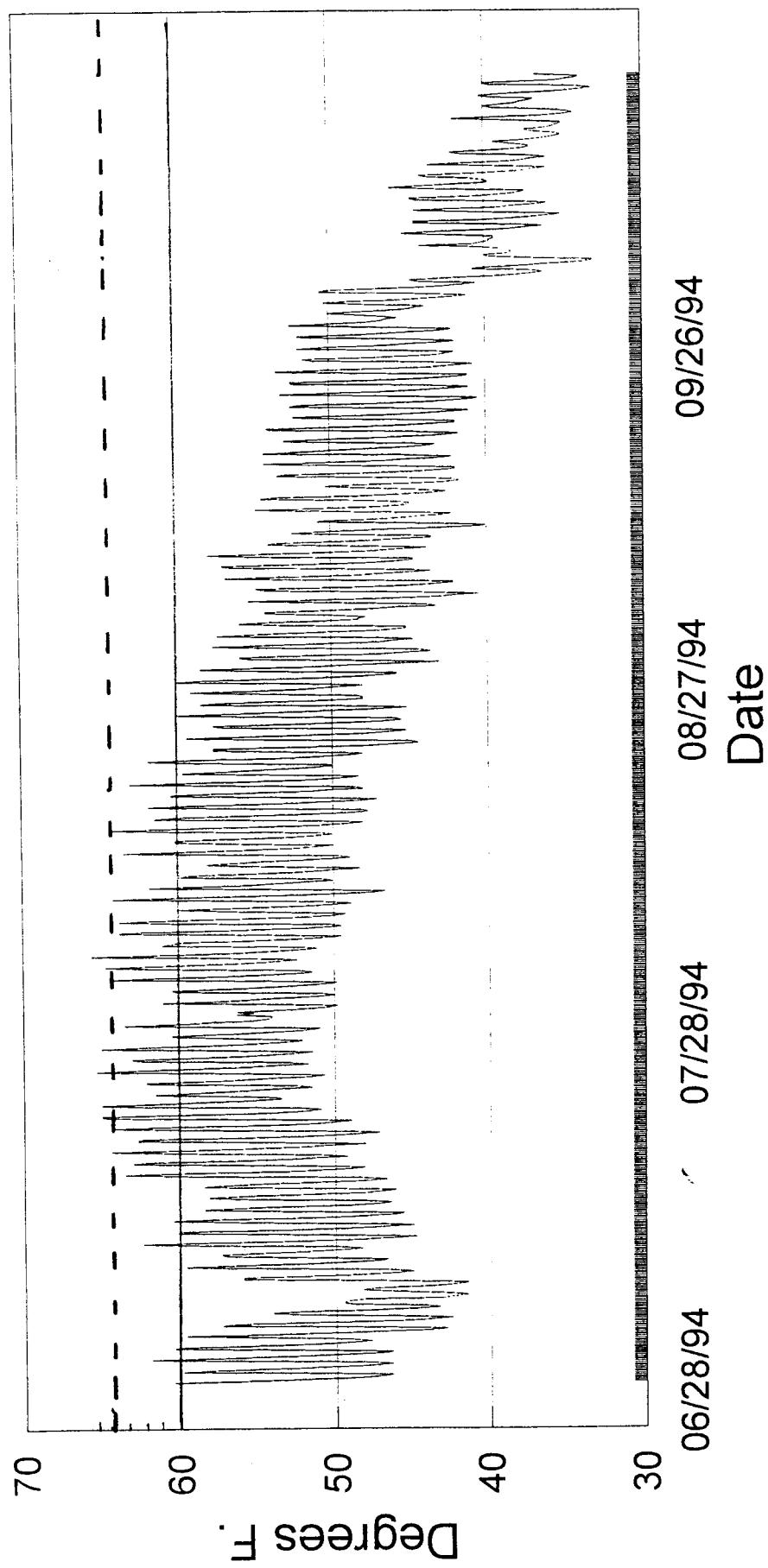
## Upper Basin Creek 1994 HOBO Temperatures



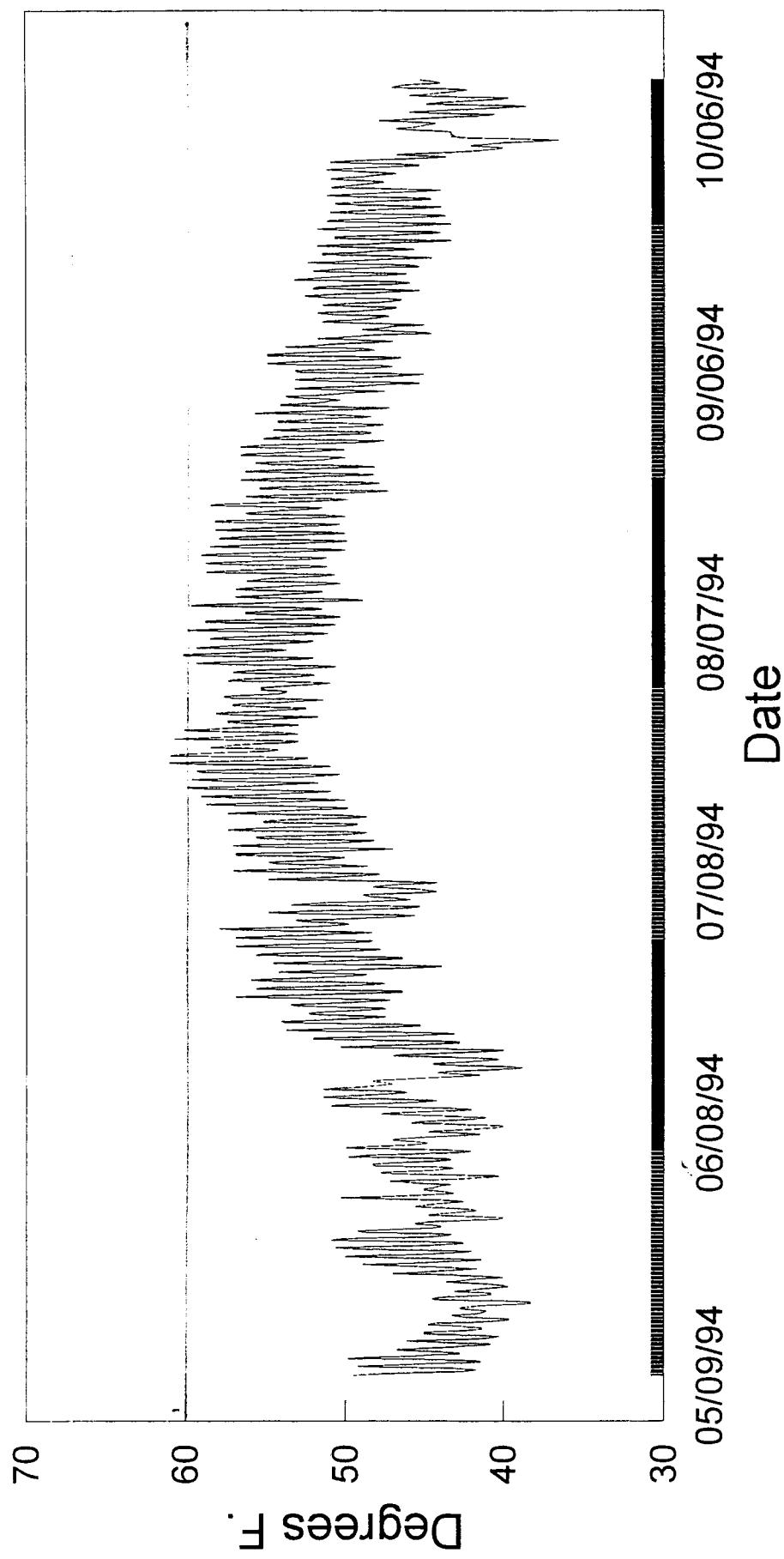
**Bayhorse Creek**  
**1994 HOBO Temperatures**



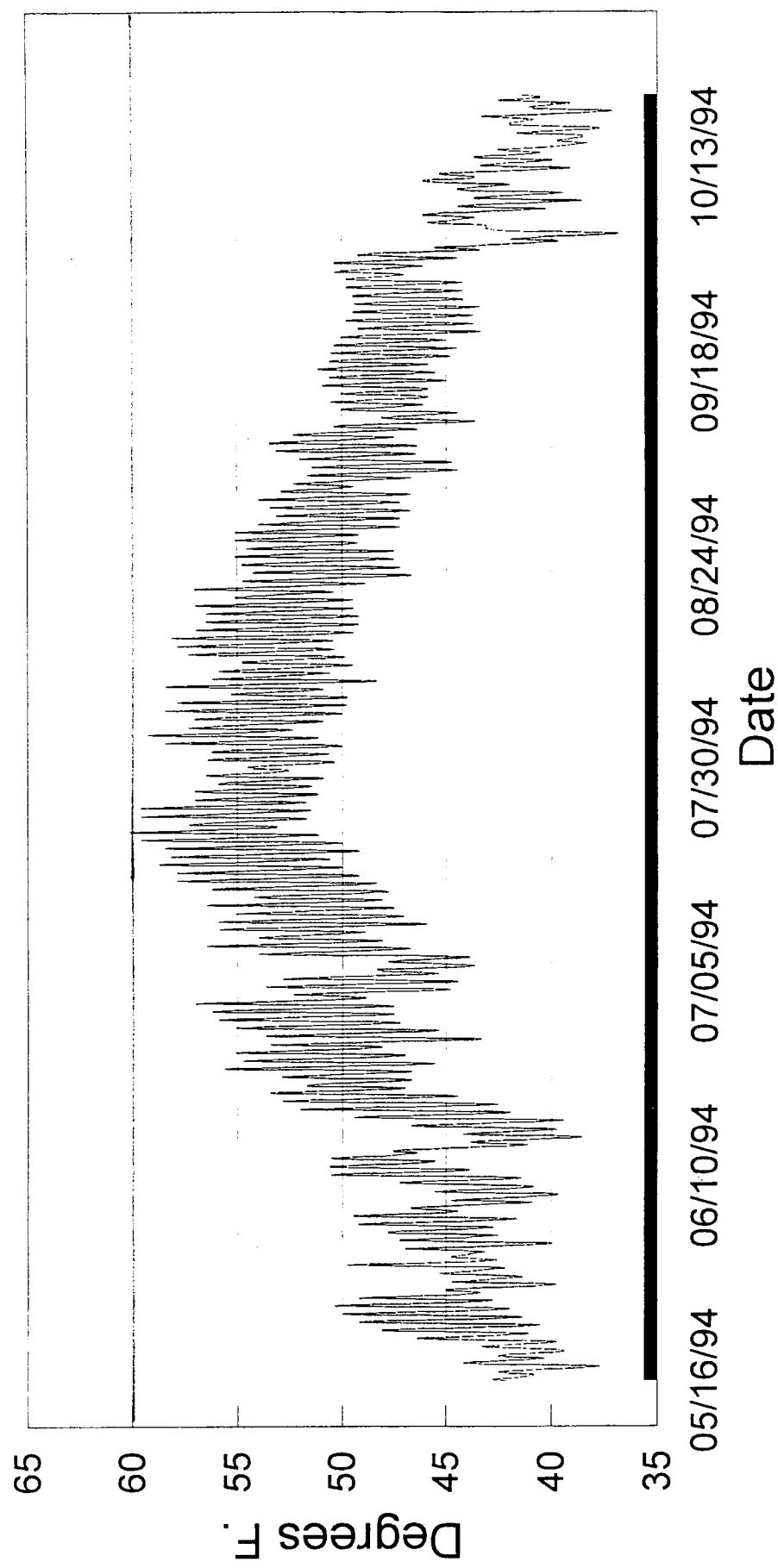
**Big Hat Creek**  
**1994 HOBO Temperatures**



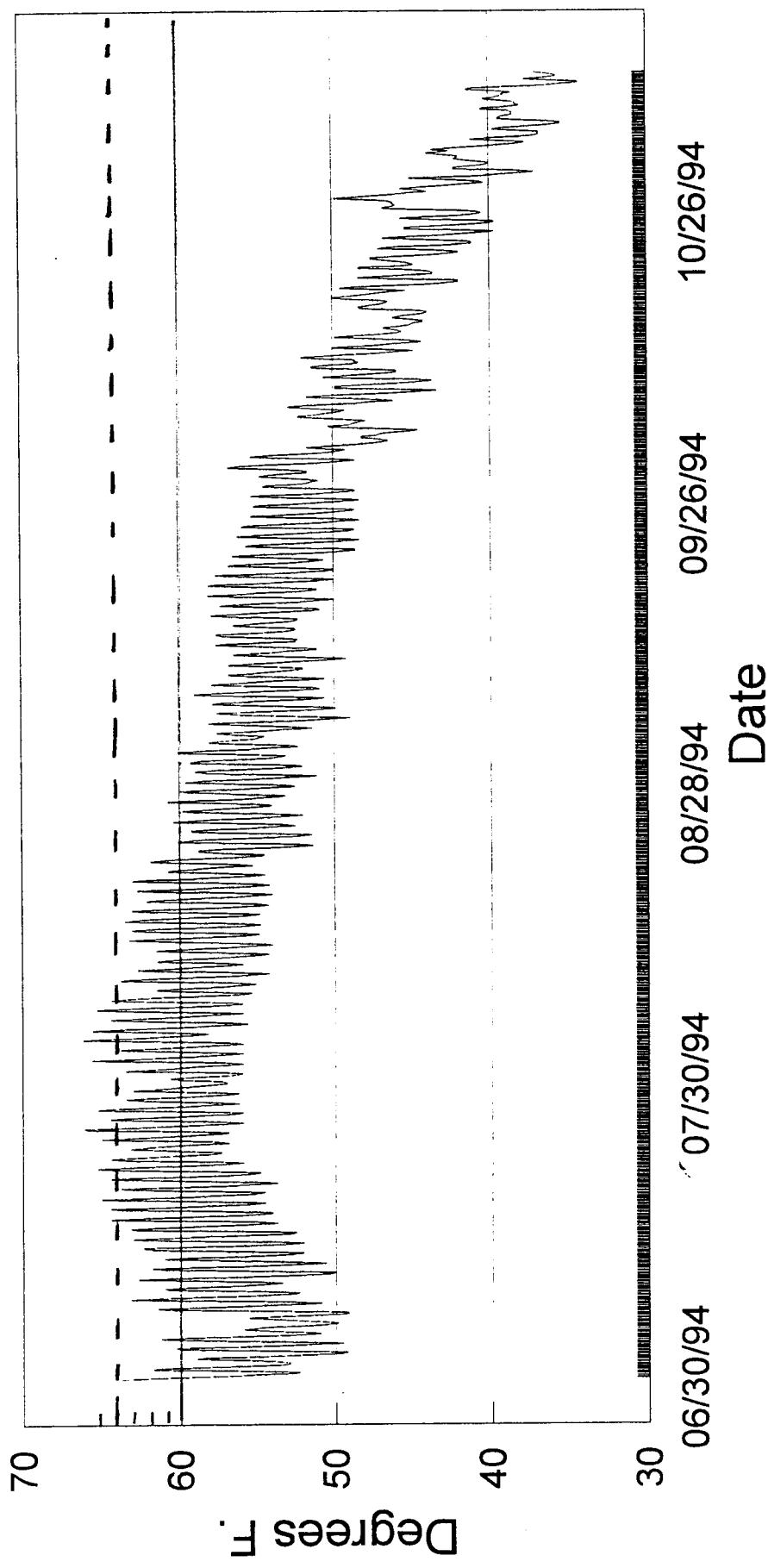
**Cow Creek**  
**1994 HOBO Temperatures**



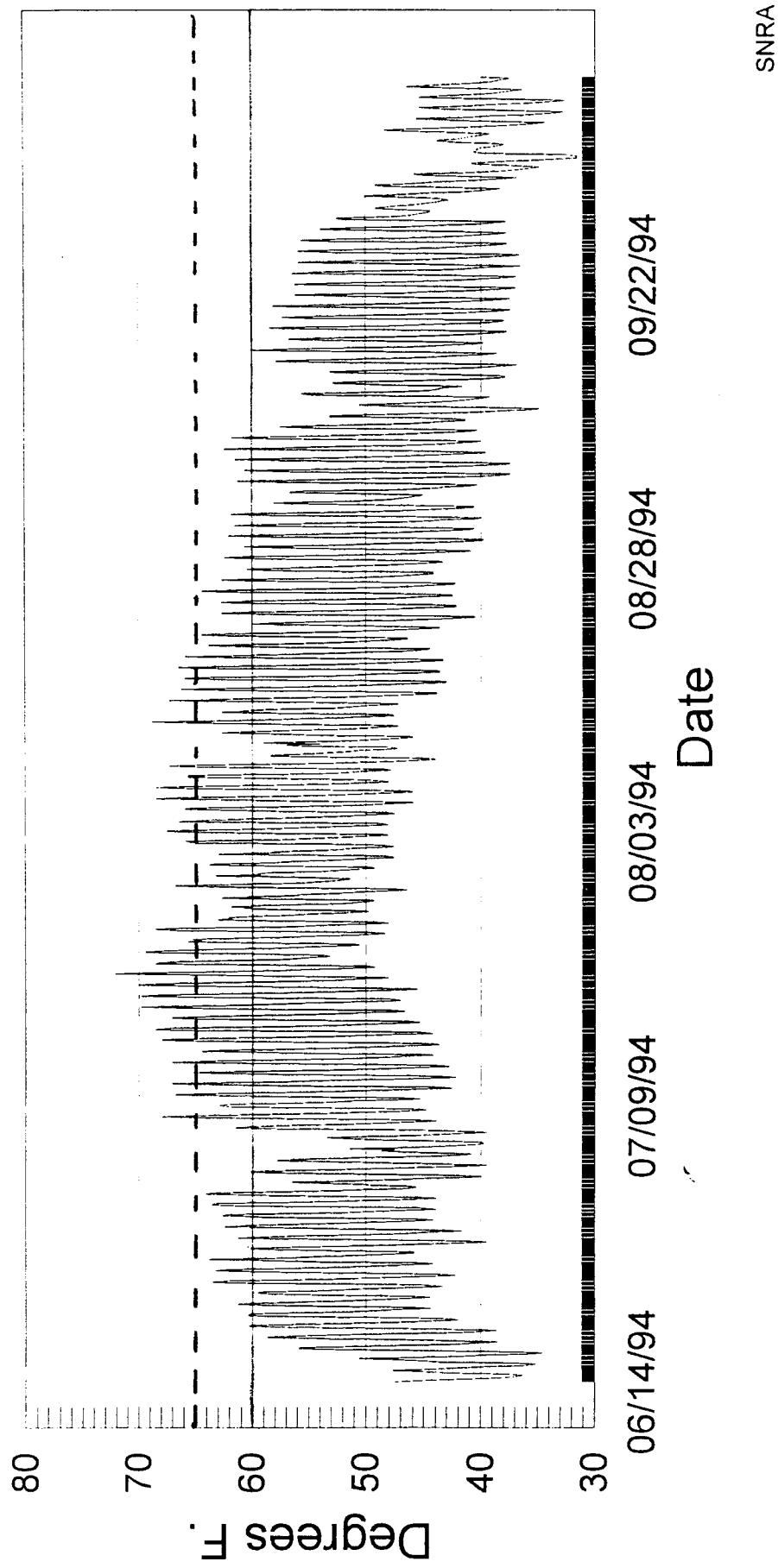
**Cow Creek**  
**1994 HOBO Temperatures**



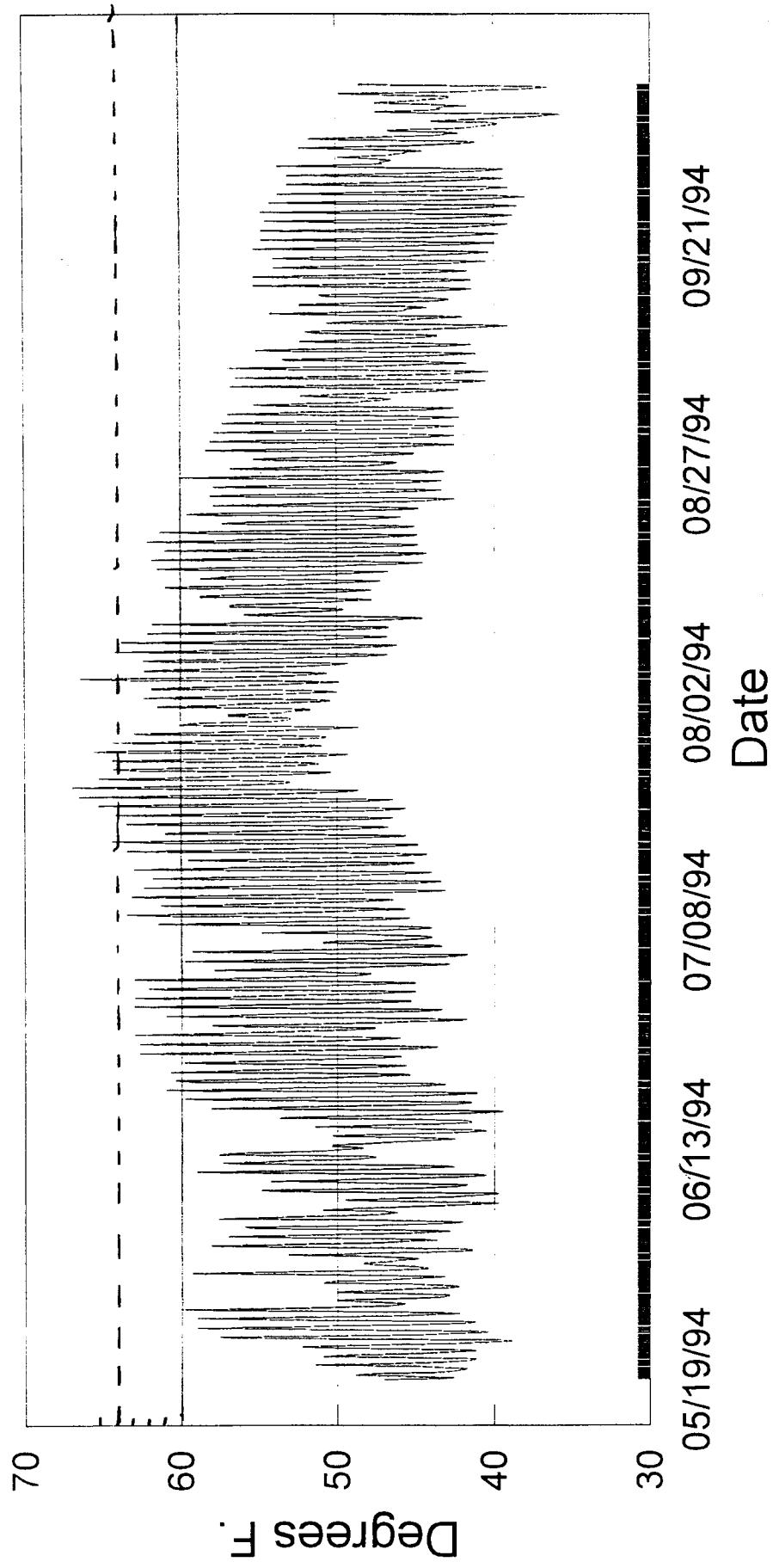
## Fourth of July Creek 1994 HOBO Temperatures



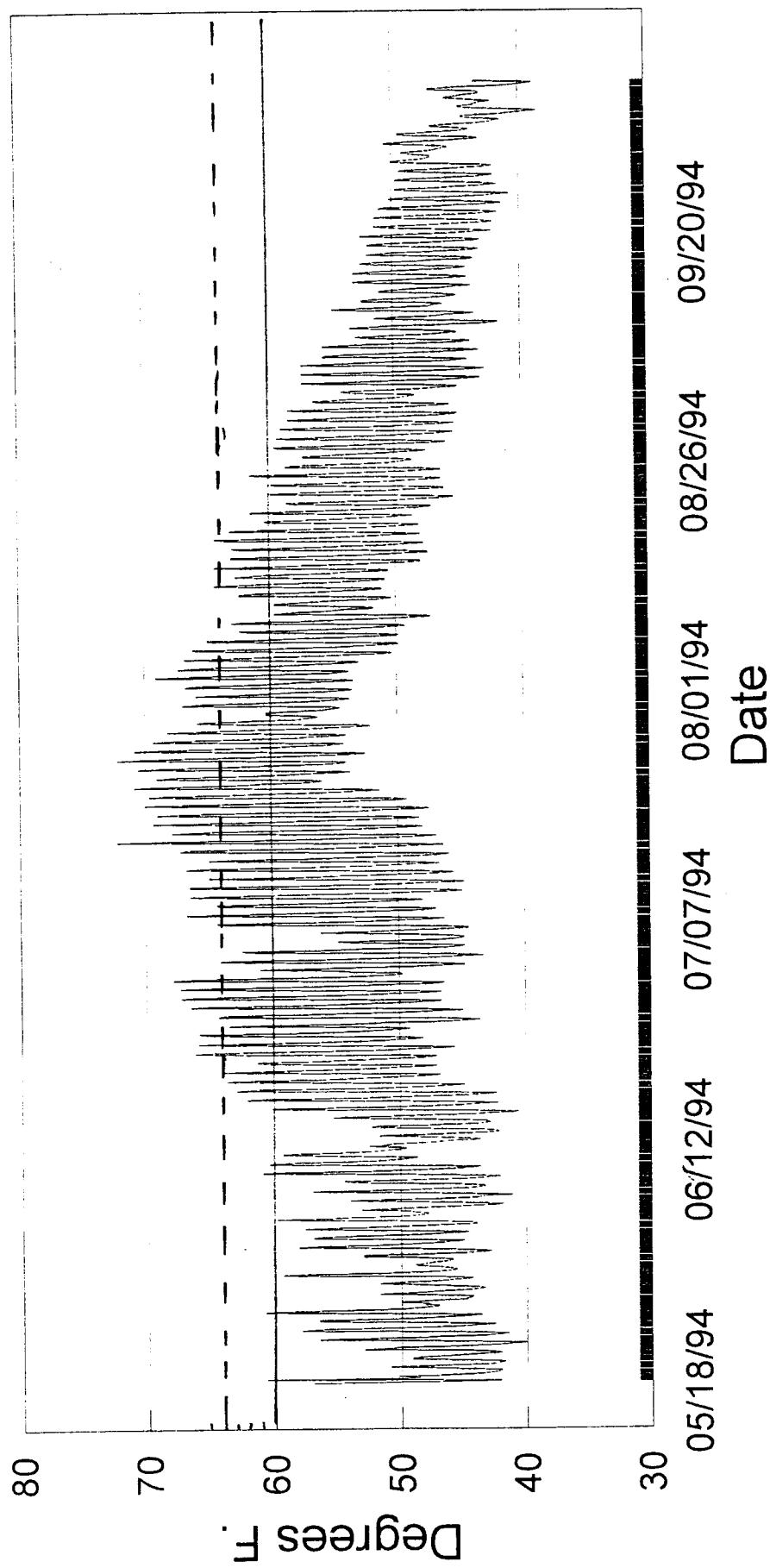
## Fourth of July Creek above FJC1 diversion 1994 HOBO Temperatures



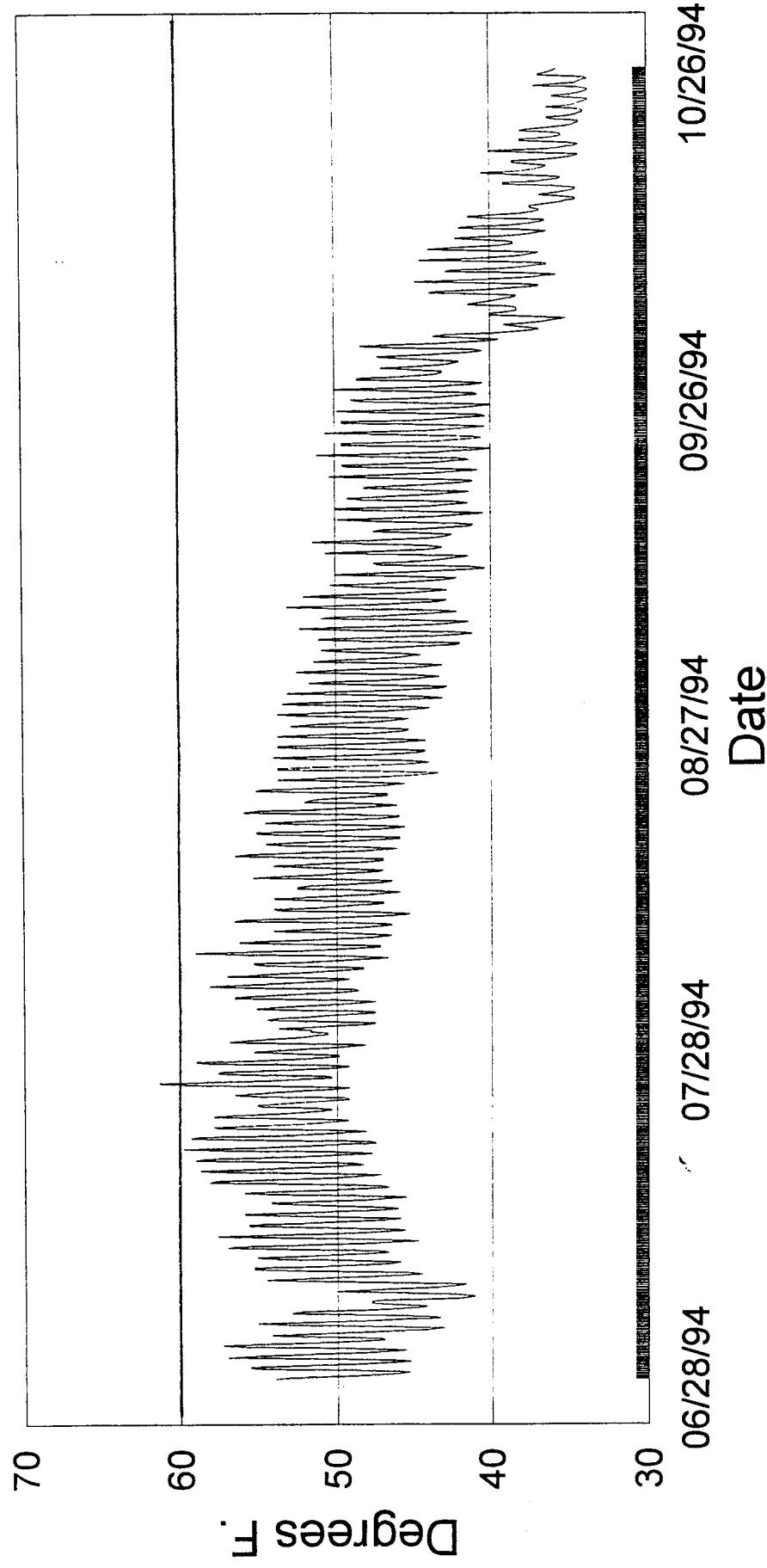
## Lower Joe's Gulch 1994 HOBO Temperatures



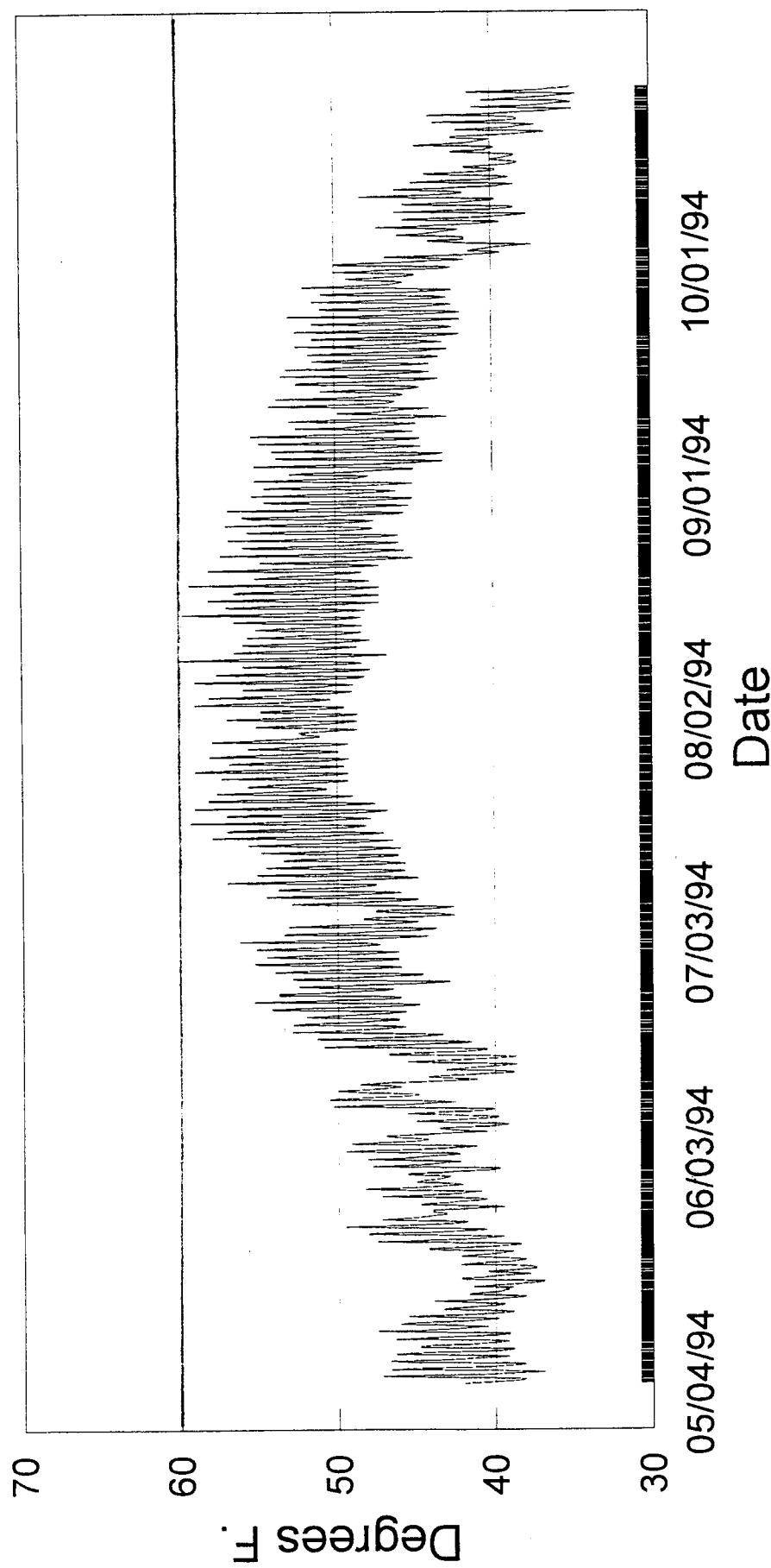
**Upper Joe's Gulch  
1994 HOBO Temperatures**



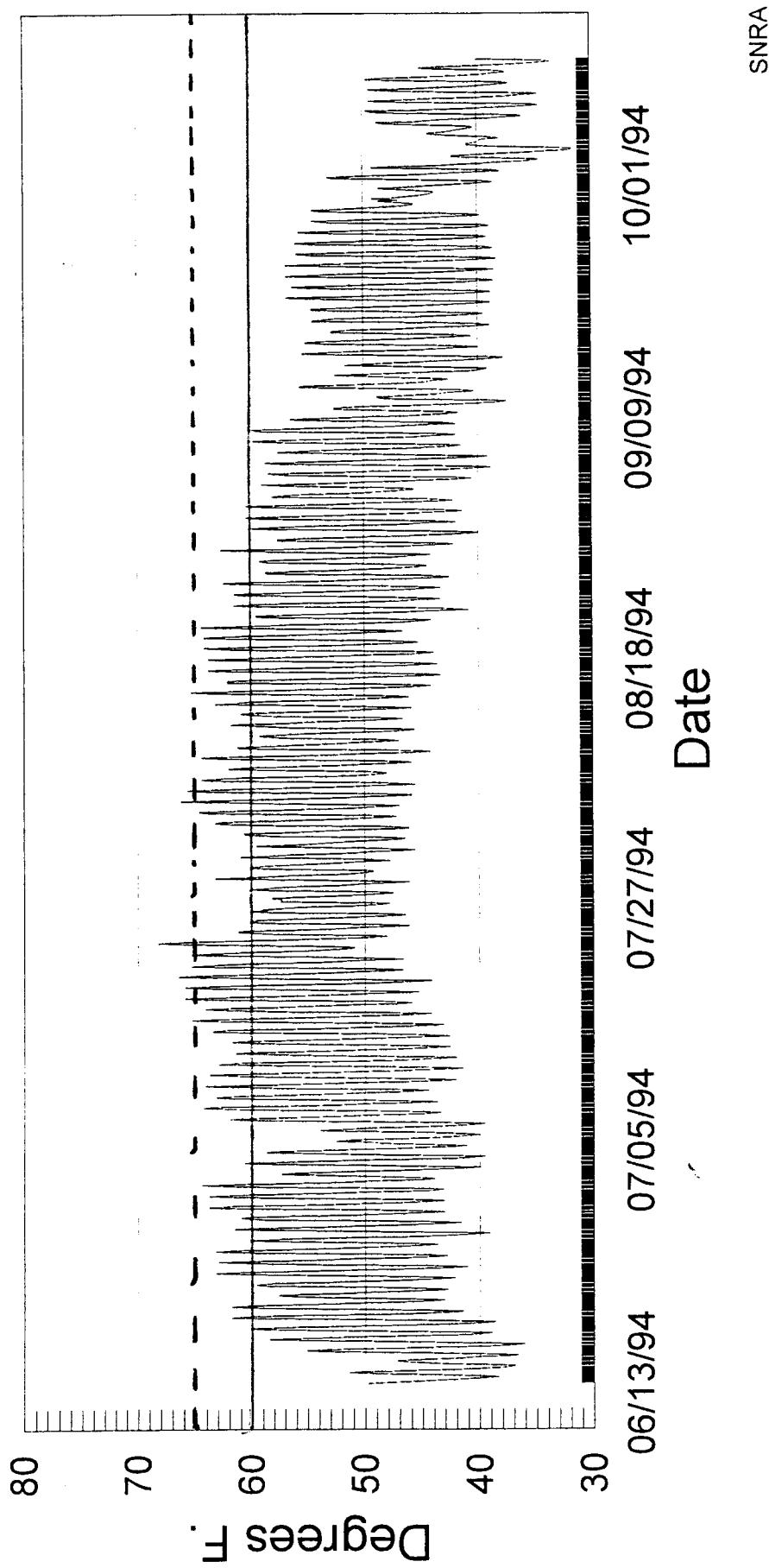
**Middle Fork Hat Creek in Meadow  
1994 HOBO Temperatures**



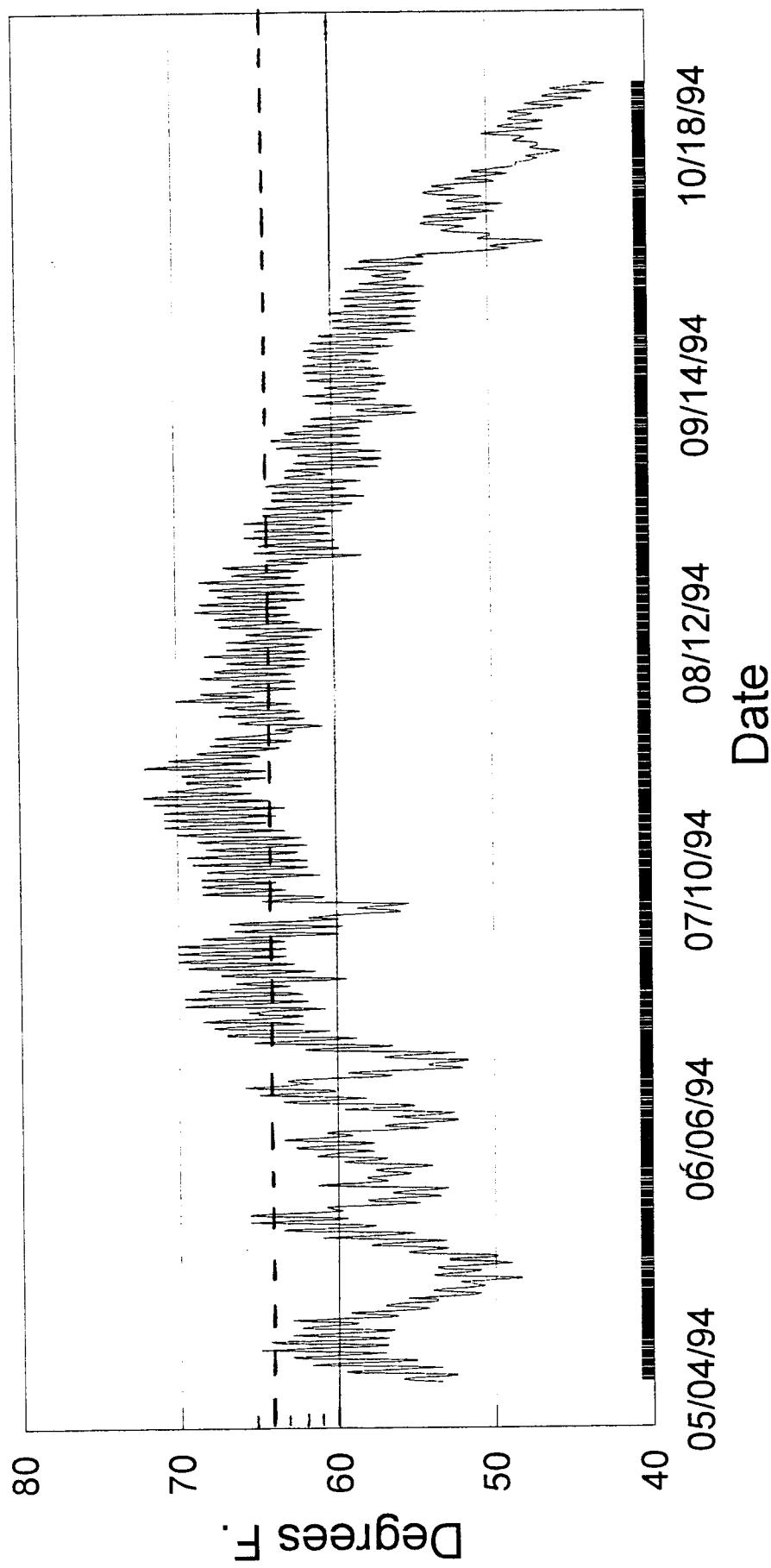
**North Fork Iron Creek (lower)**  
**1994 HOBO Temperatures**



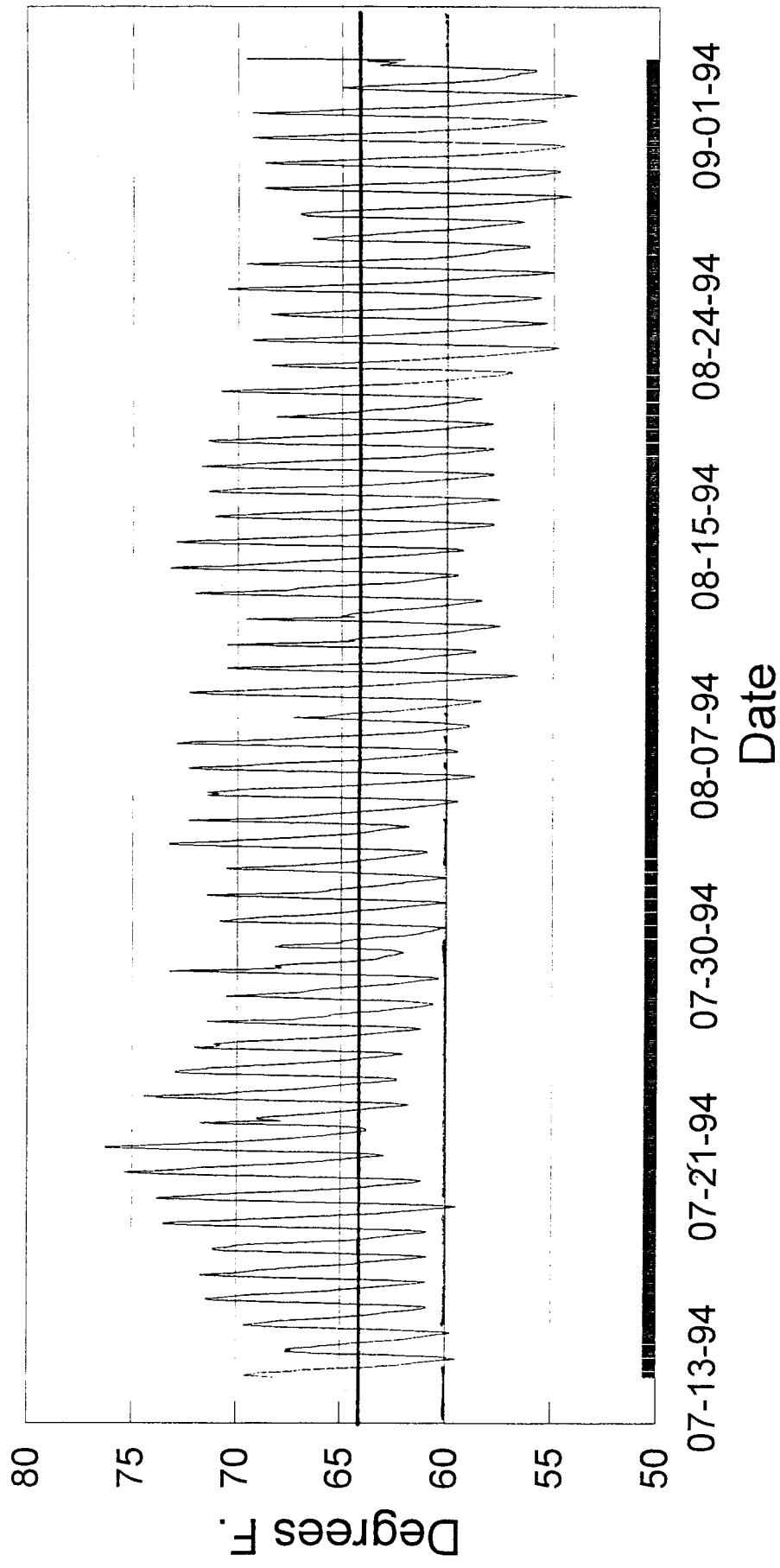
## Salmon River above Highway 75 1994 HOBO Temperatures



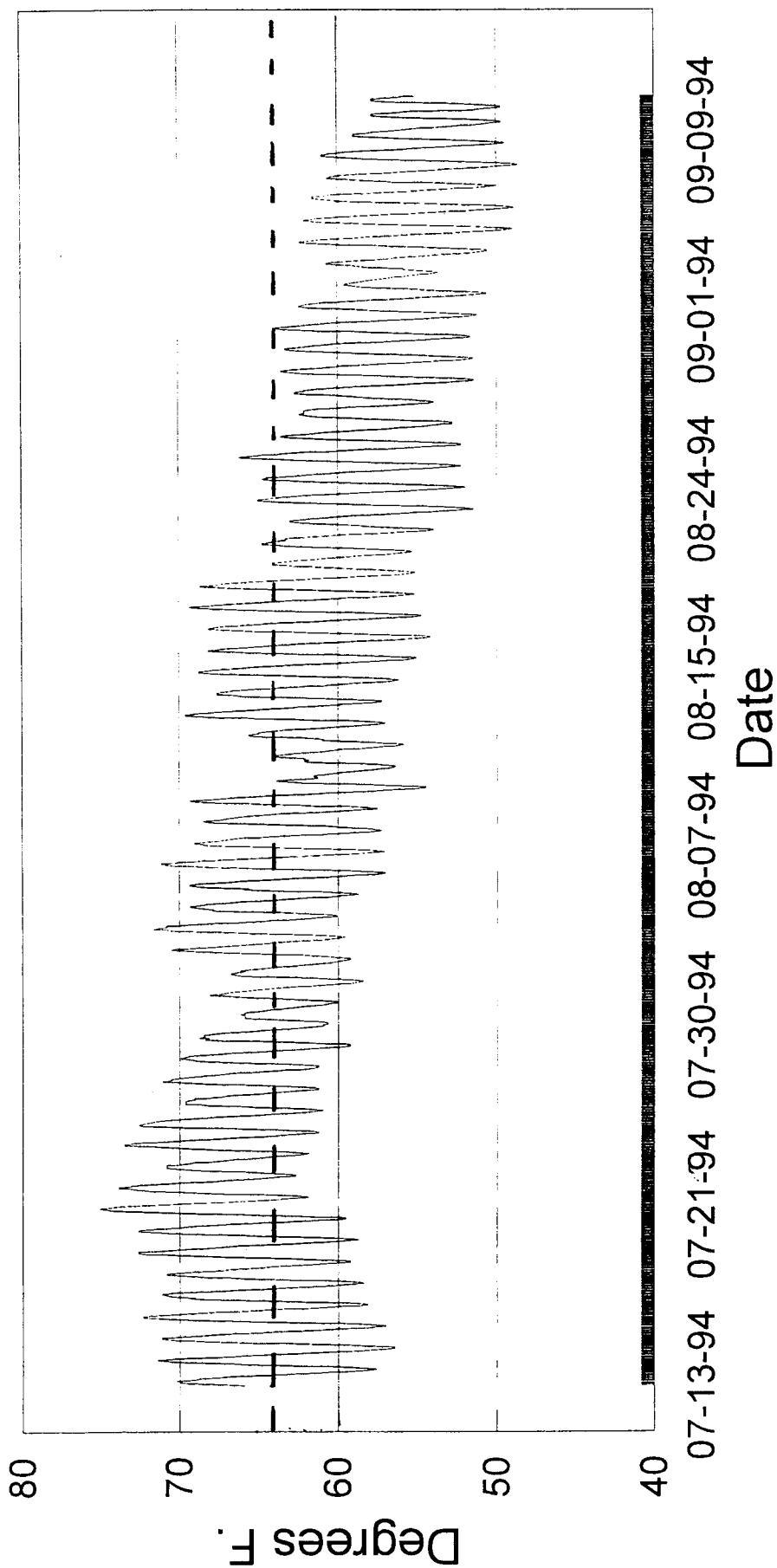
**Salmon River above Lemhi River  
1994 HOBO Temperatures**



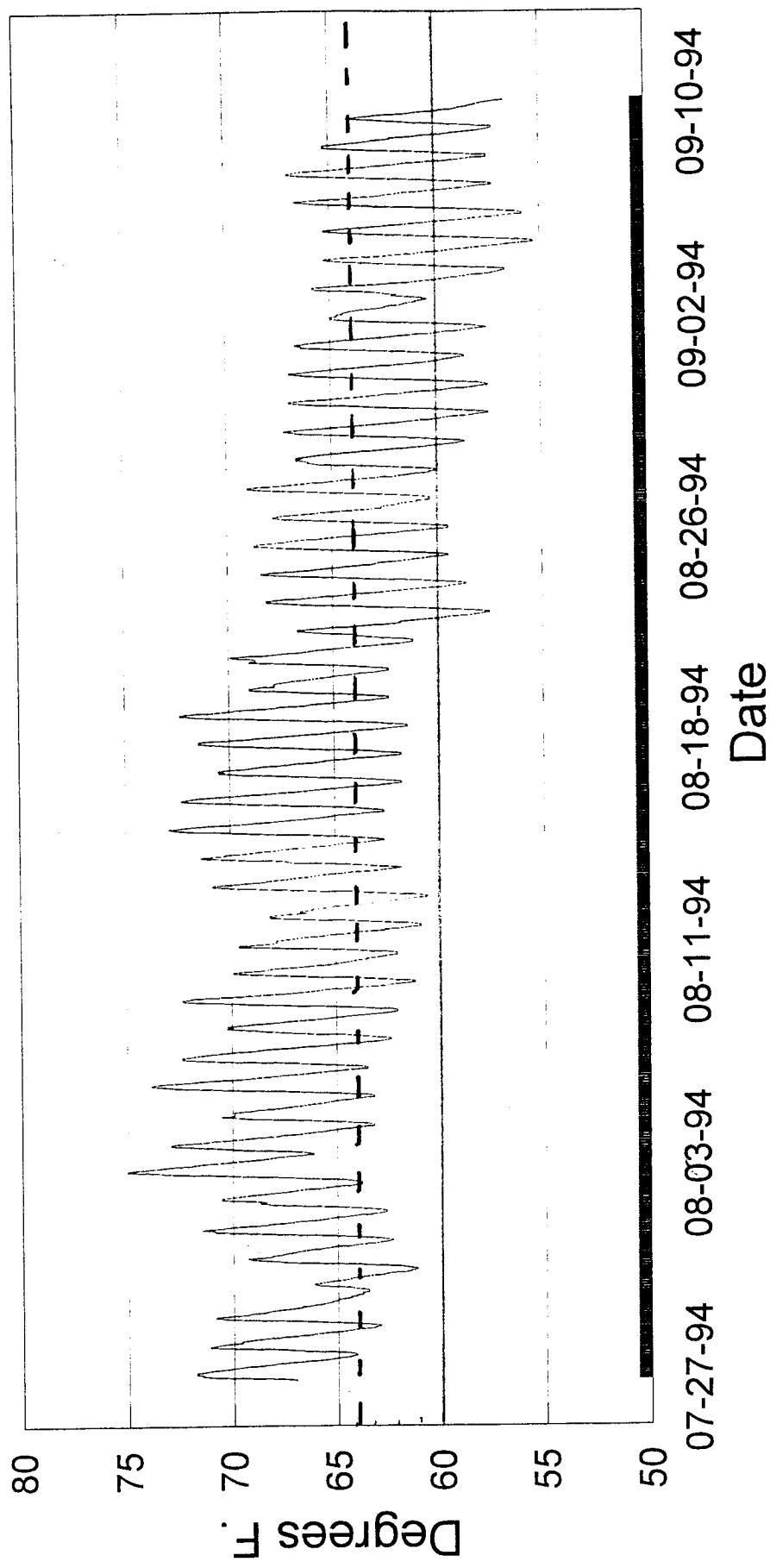
**Salmon River at Challis  
1994 HOBO Temperatures**



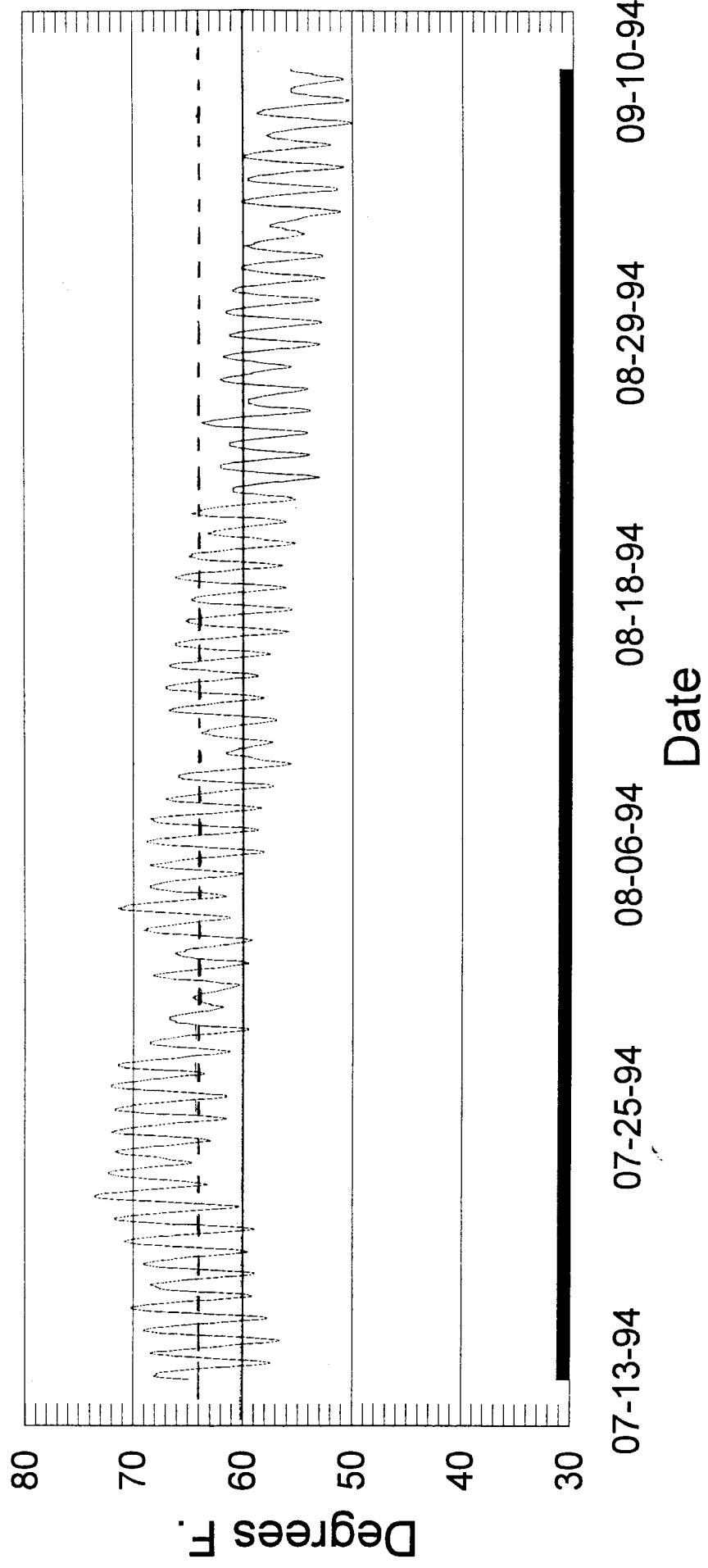
## Salmon River at Clayton 1994 HOBO Temperatures



## Salmon River at Salmon 1994 HOBO Temperatures

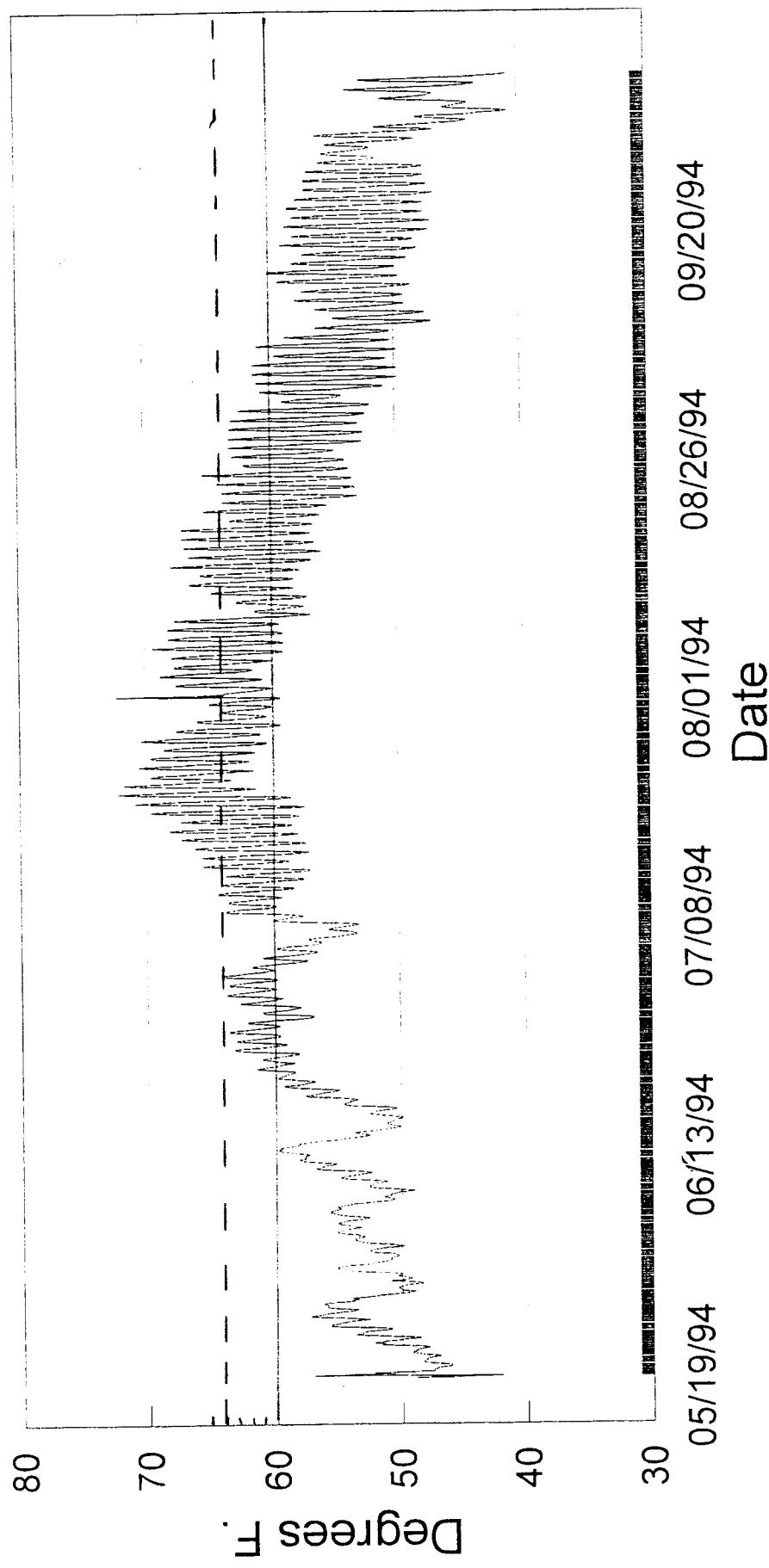


## Salmon R. at Sunbeam 1994 HOBO Temperatures

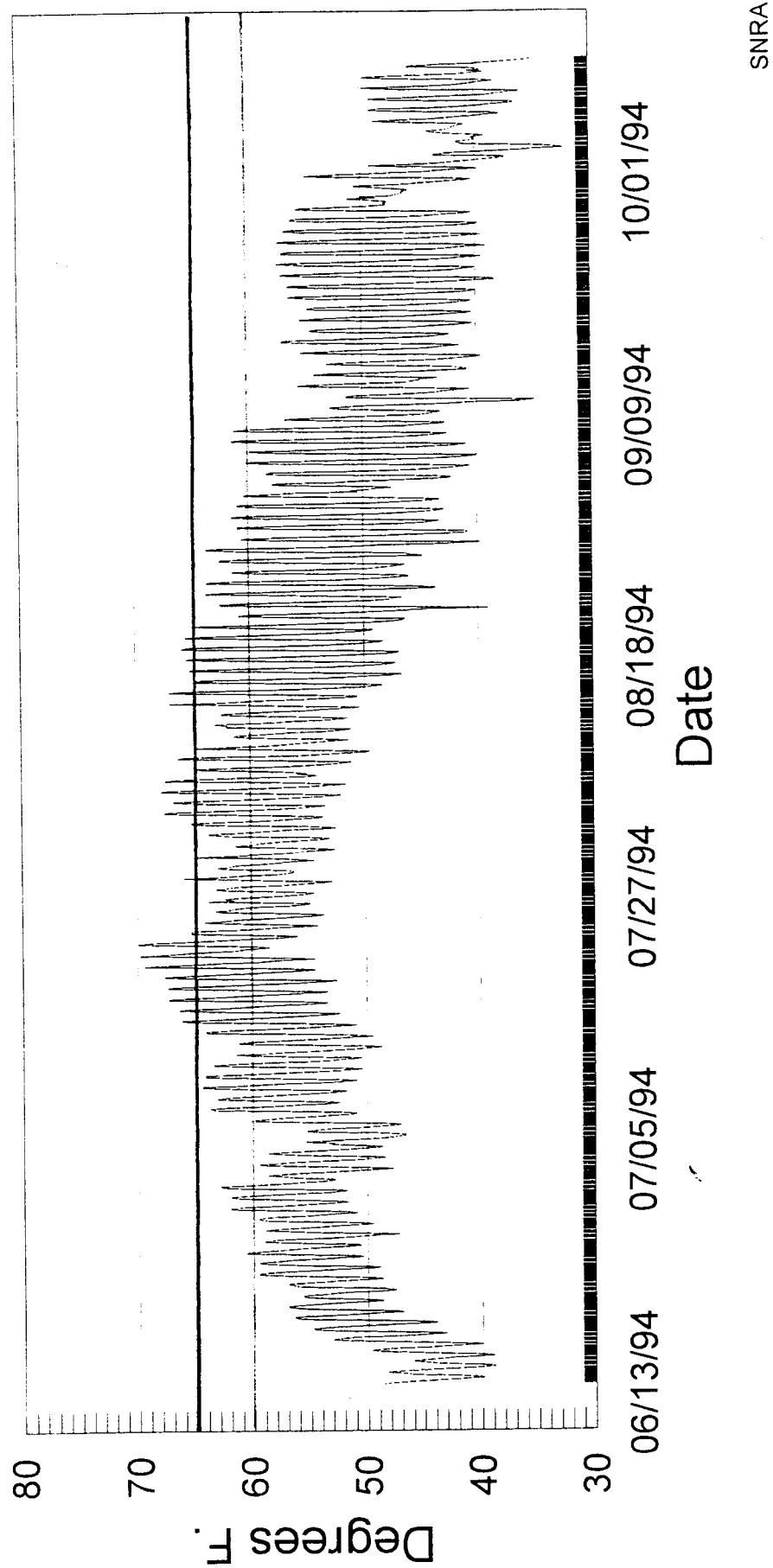


IDFG

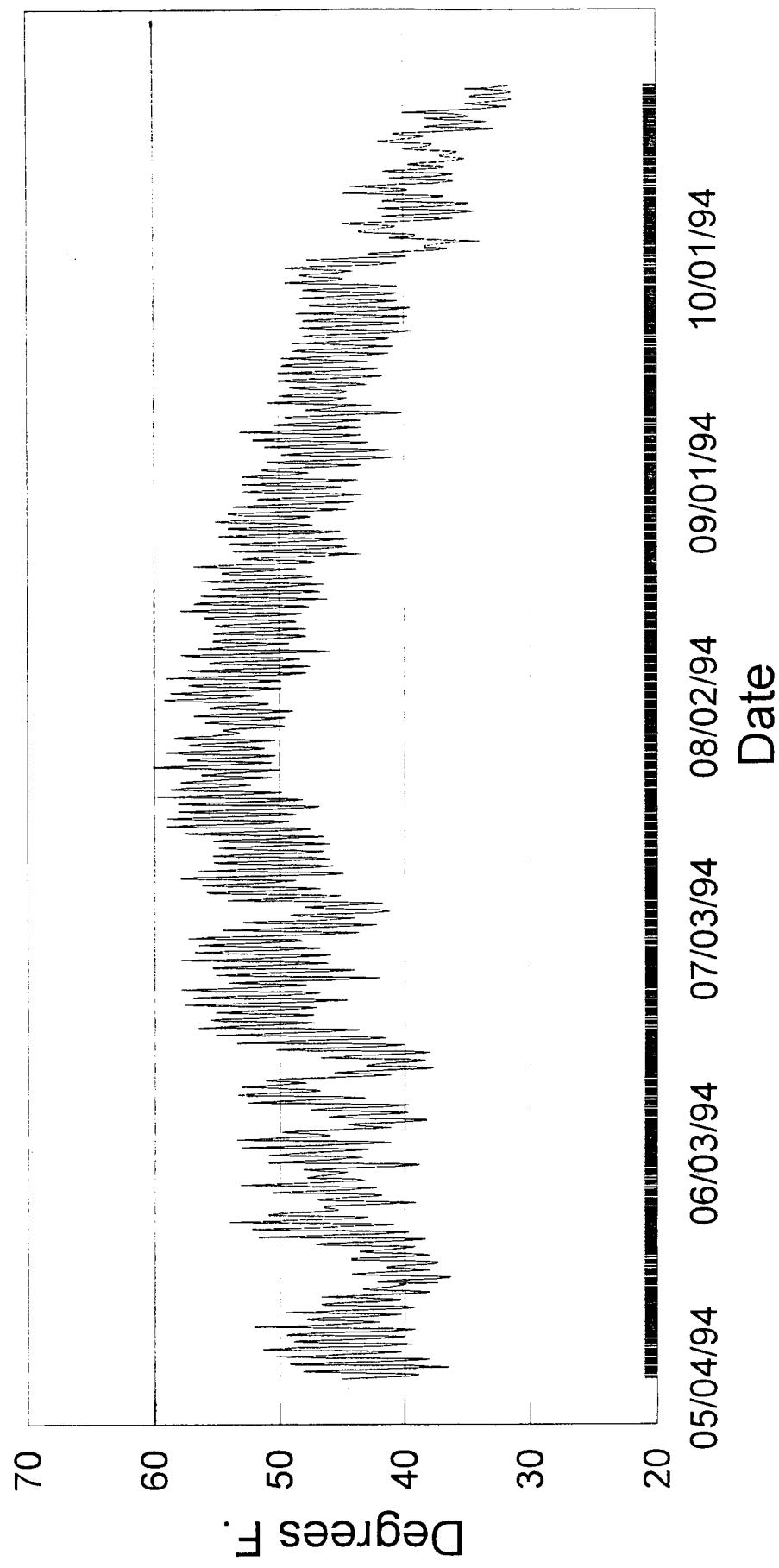
**Salmon River at USFS Yankee Fork District Office**  
**1994 HOBO Temperatures**

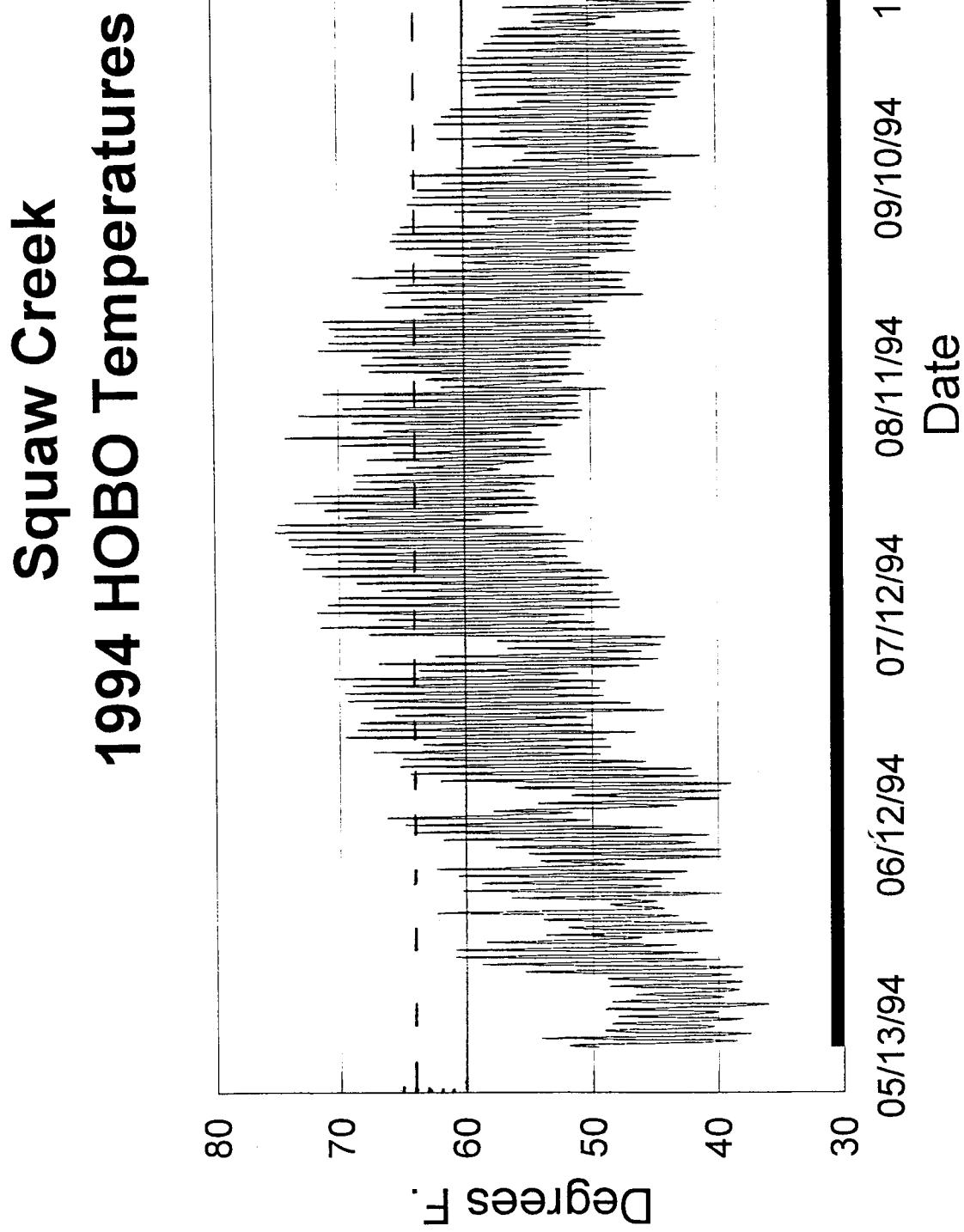


## Smiley Creek 1994 HOBO Temperatures

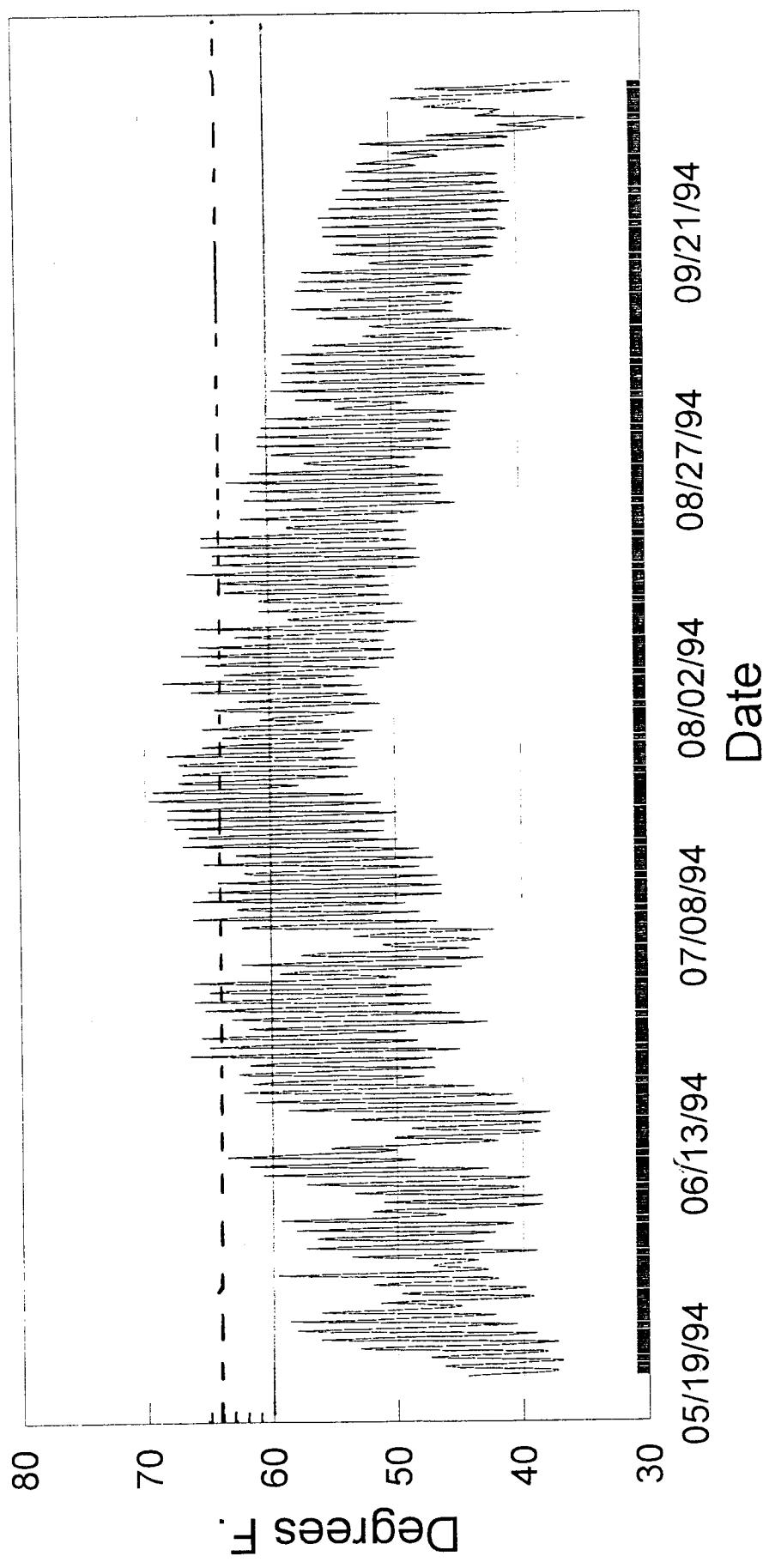


**South Fork Iron Creek  
1994 HOBO Temperatures**

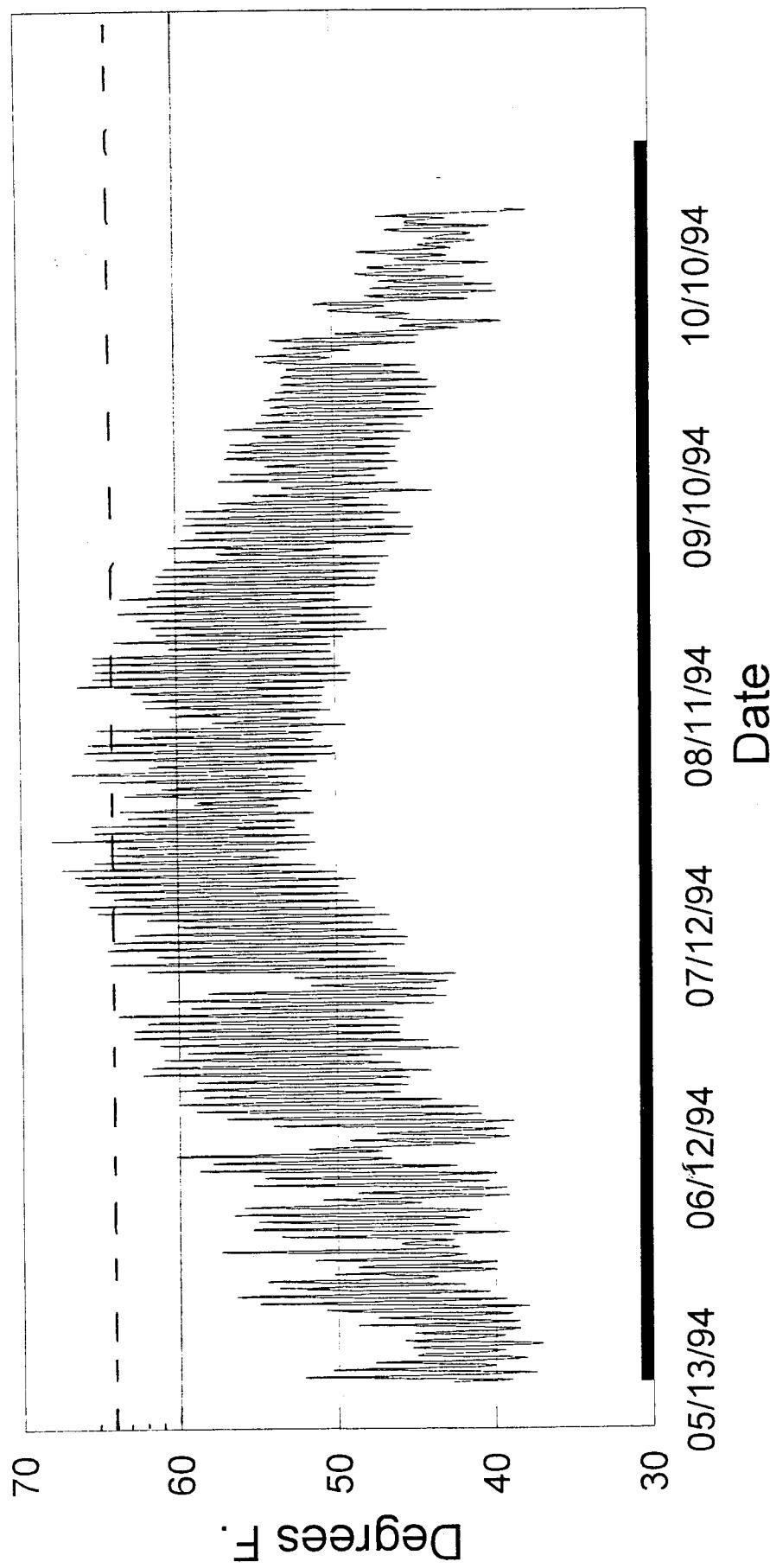




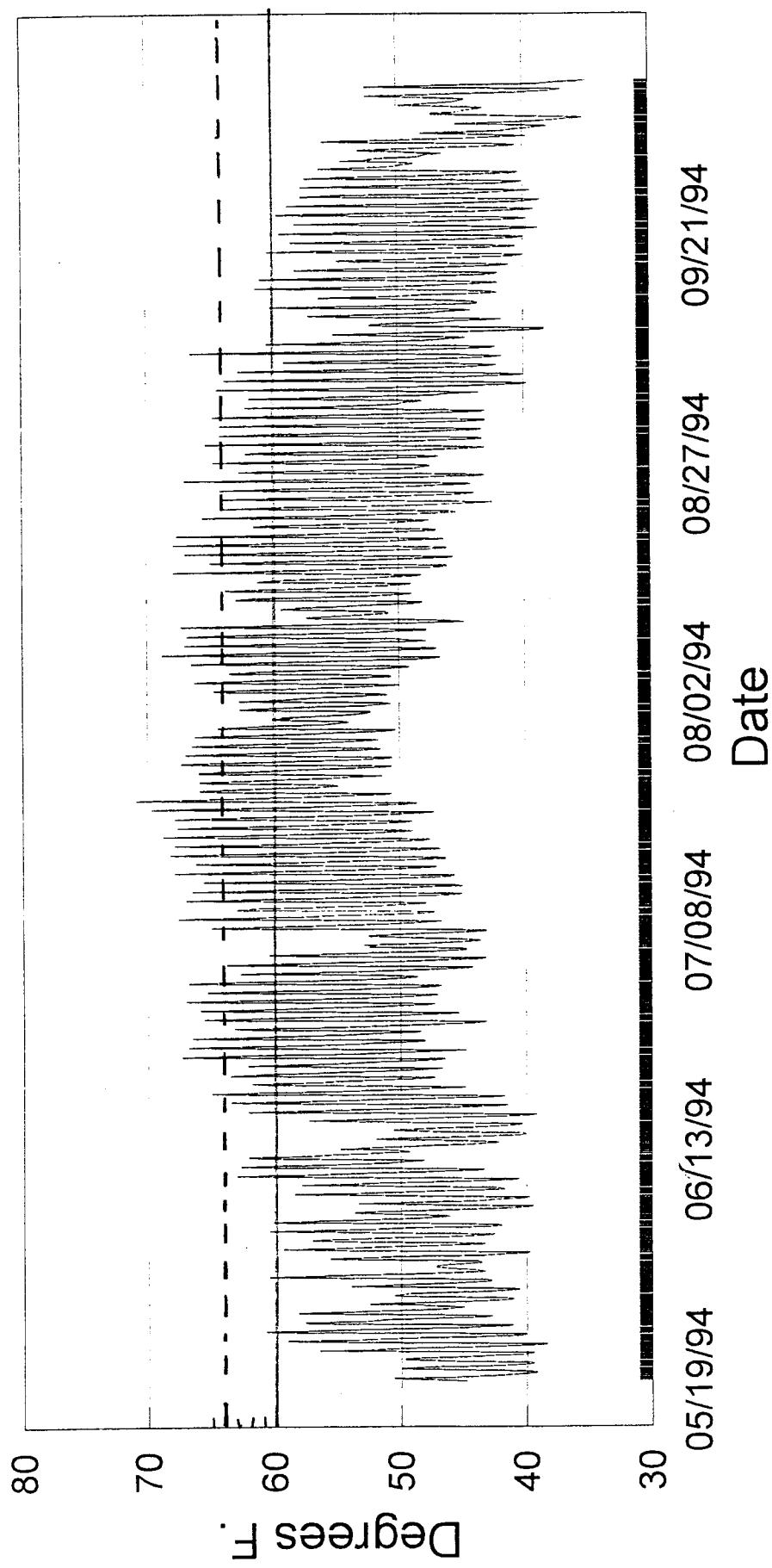
Squaw Creek (Upper Salmon River)  
1994 HOBO Temperatures



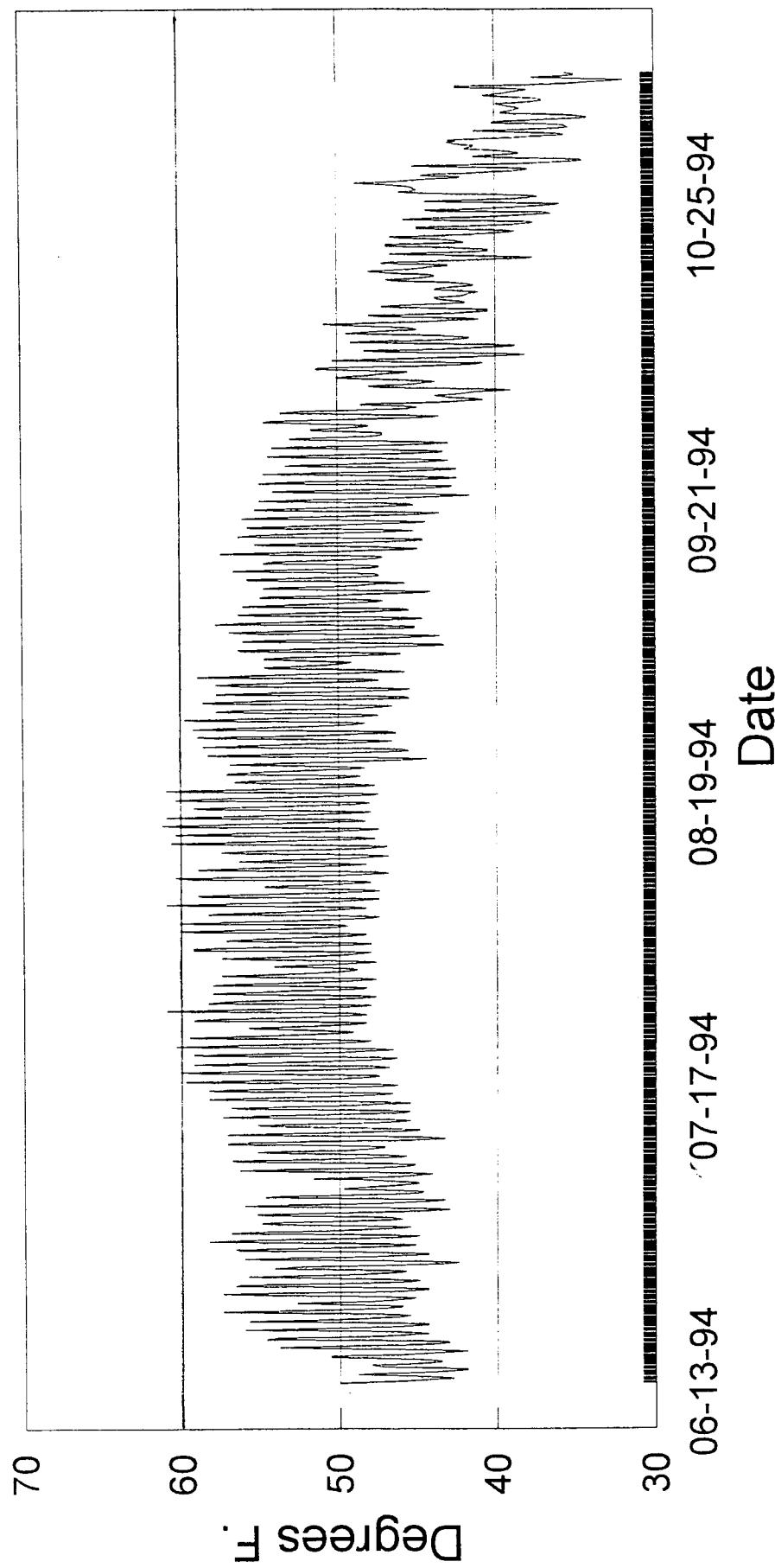
**Thompson Creek**  
**1994 HOBO Temperatures**



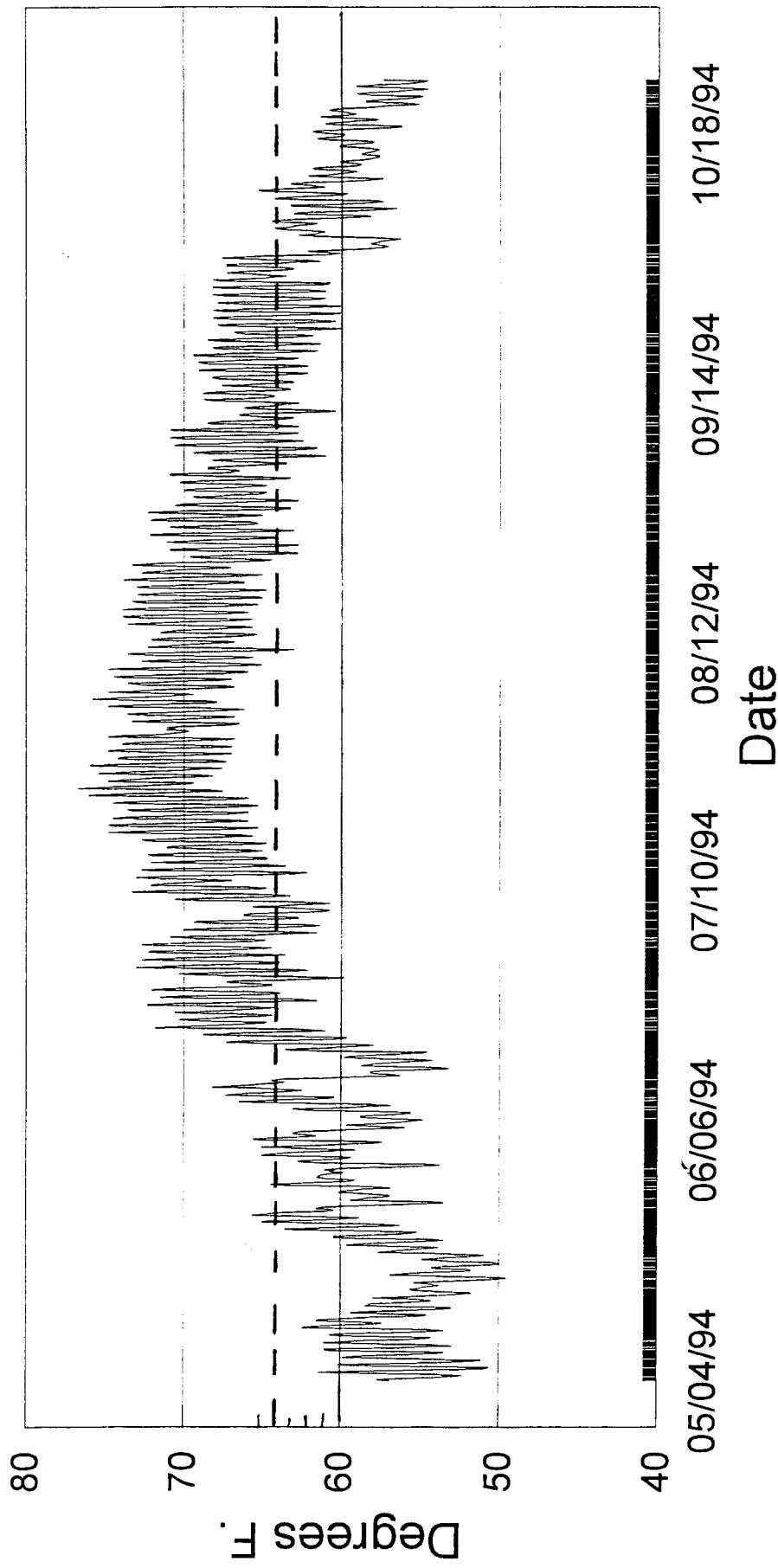
**Thompson Creek**  
**1994 HOBO Temperatures**



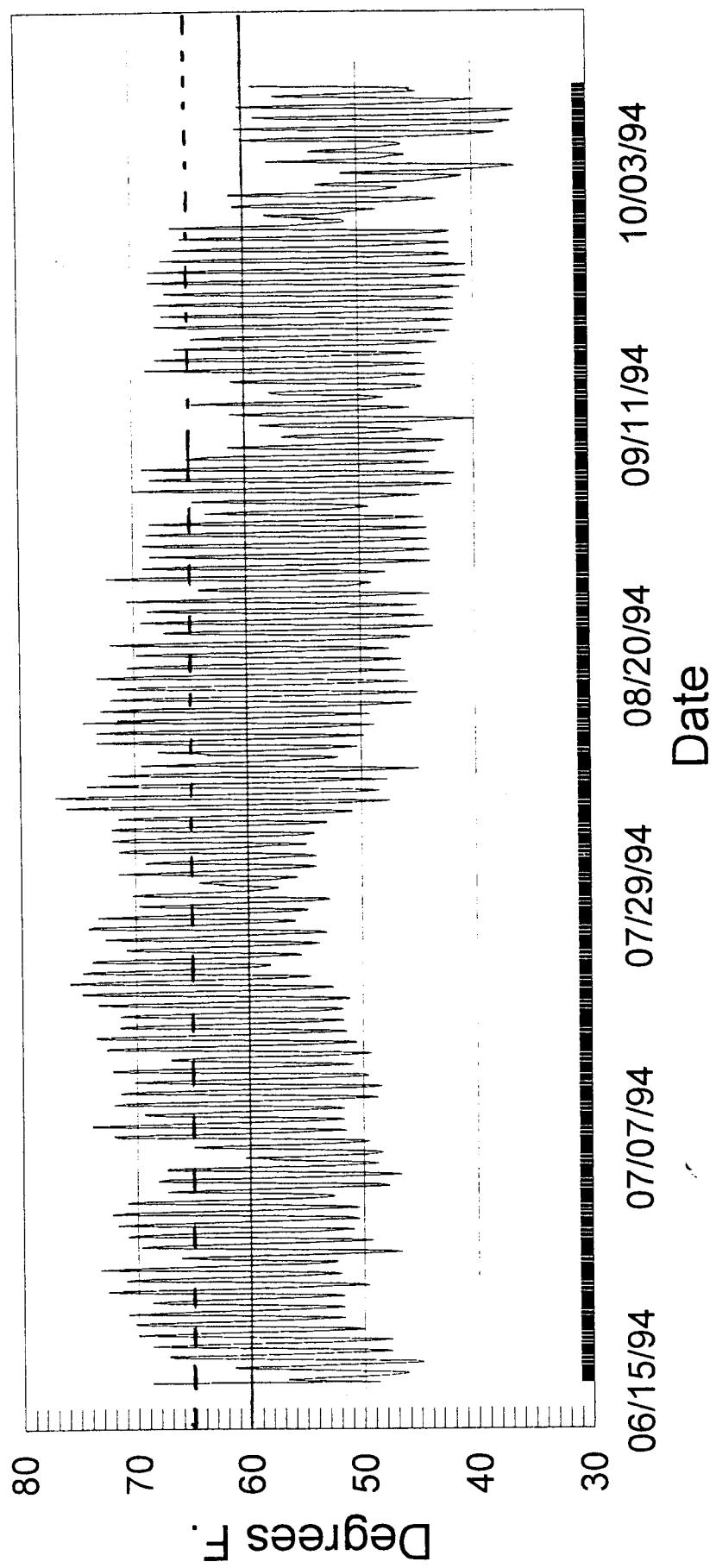
**Wagonhammer Creek  
1994 HOBO Temperatures**



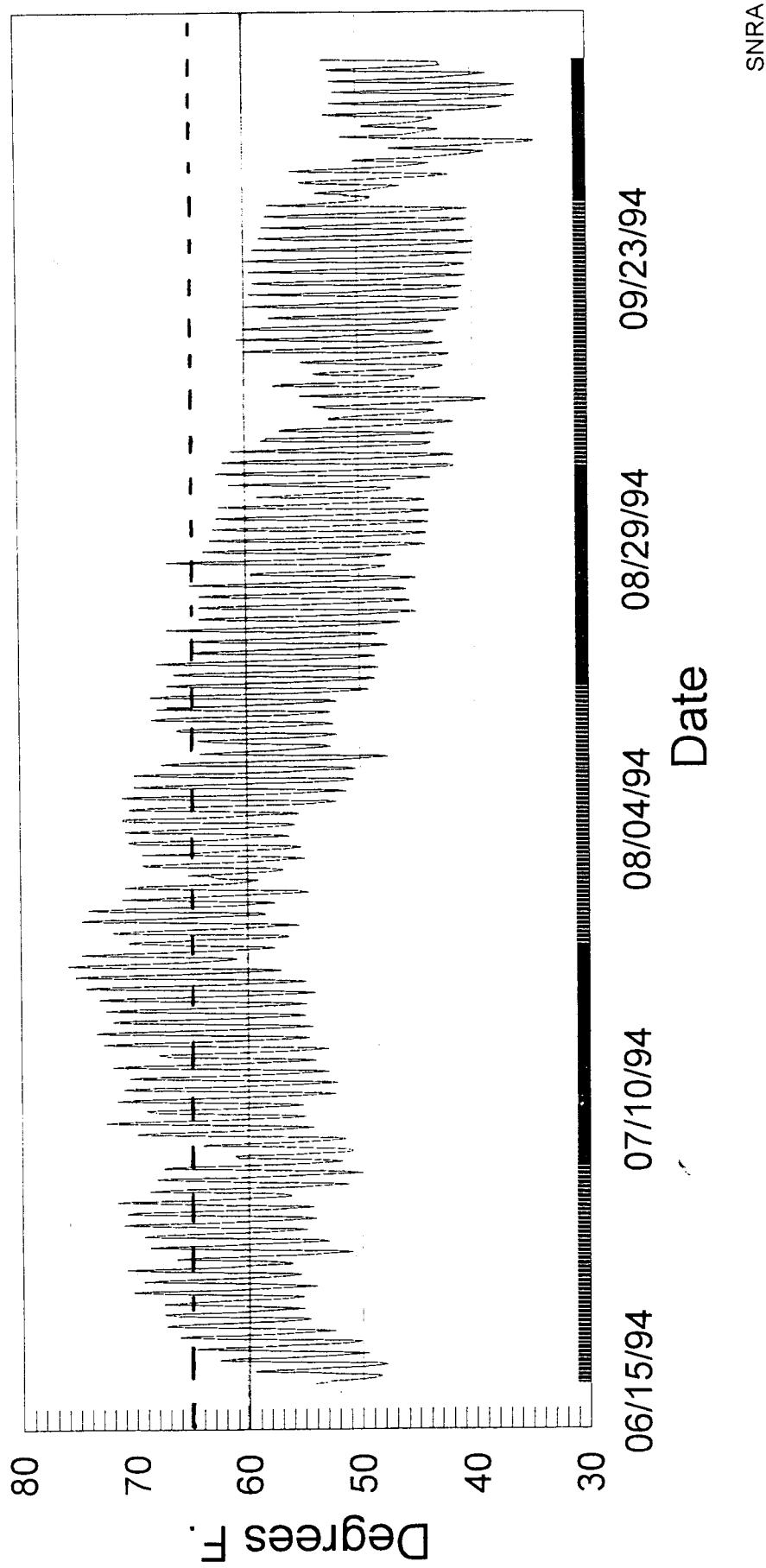
**Warm Spring Creek  
1994 HOBO Temperatures**



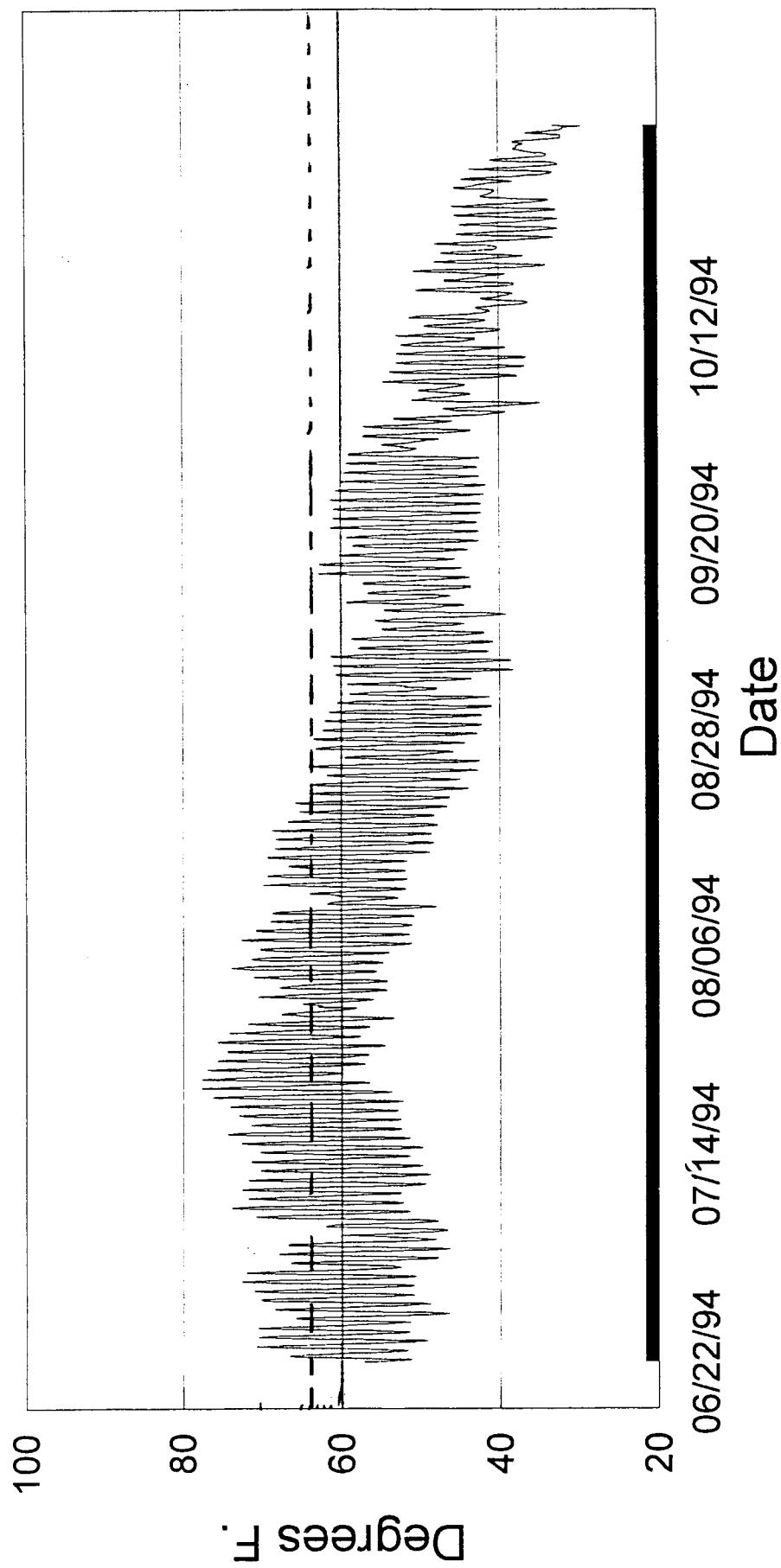
**Stanley Creek above Tennell  
1994 HOBO Temperatures**



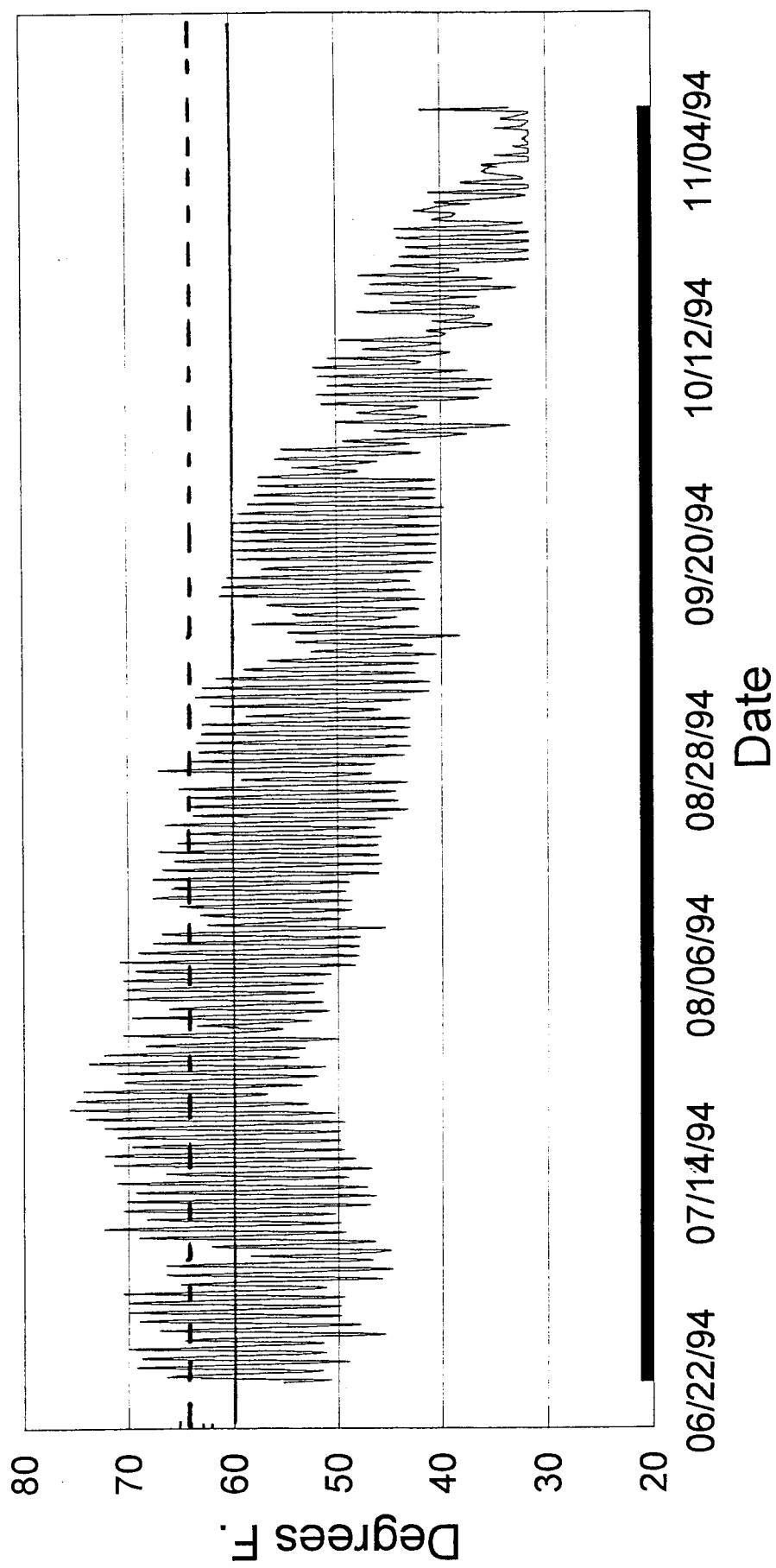
**Stanley Lake Creek near Highway 20 Bridge  
1994 HOBO Temperatures**



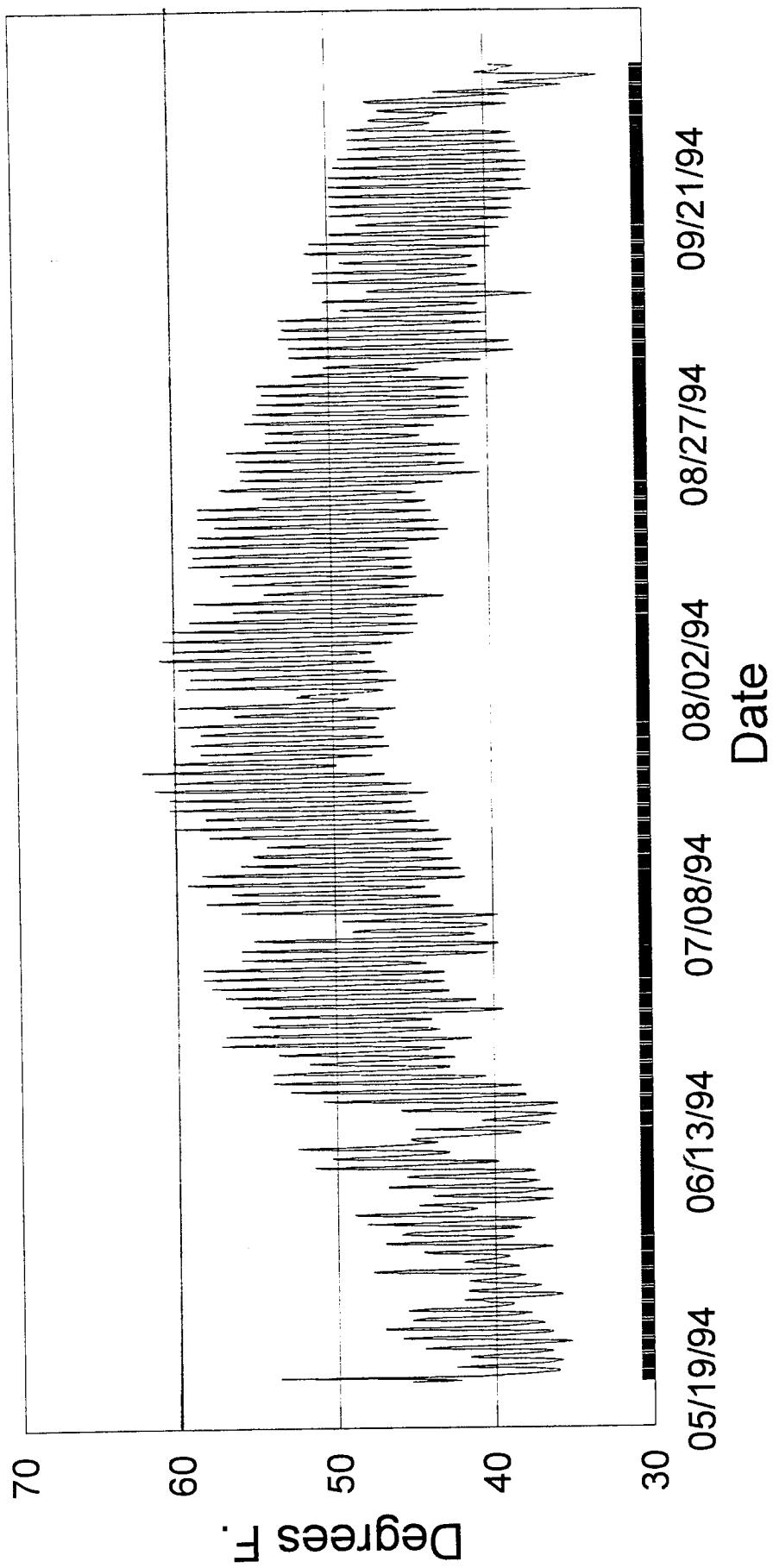
**Valley Creek Upstream of Mouth  
1994 HOBO Temperatures**



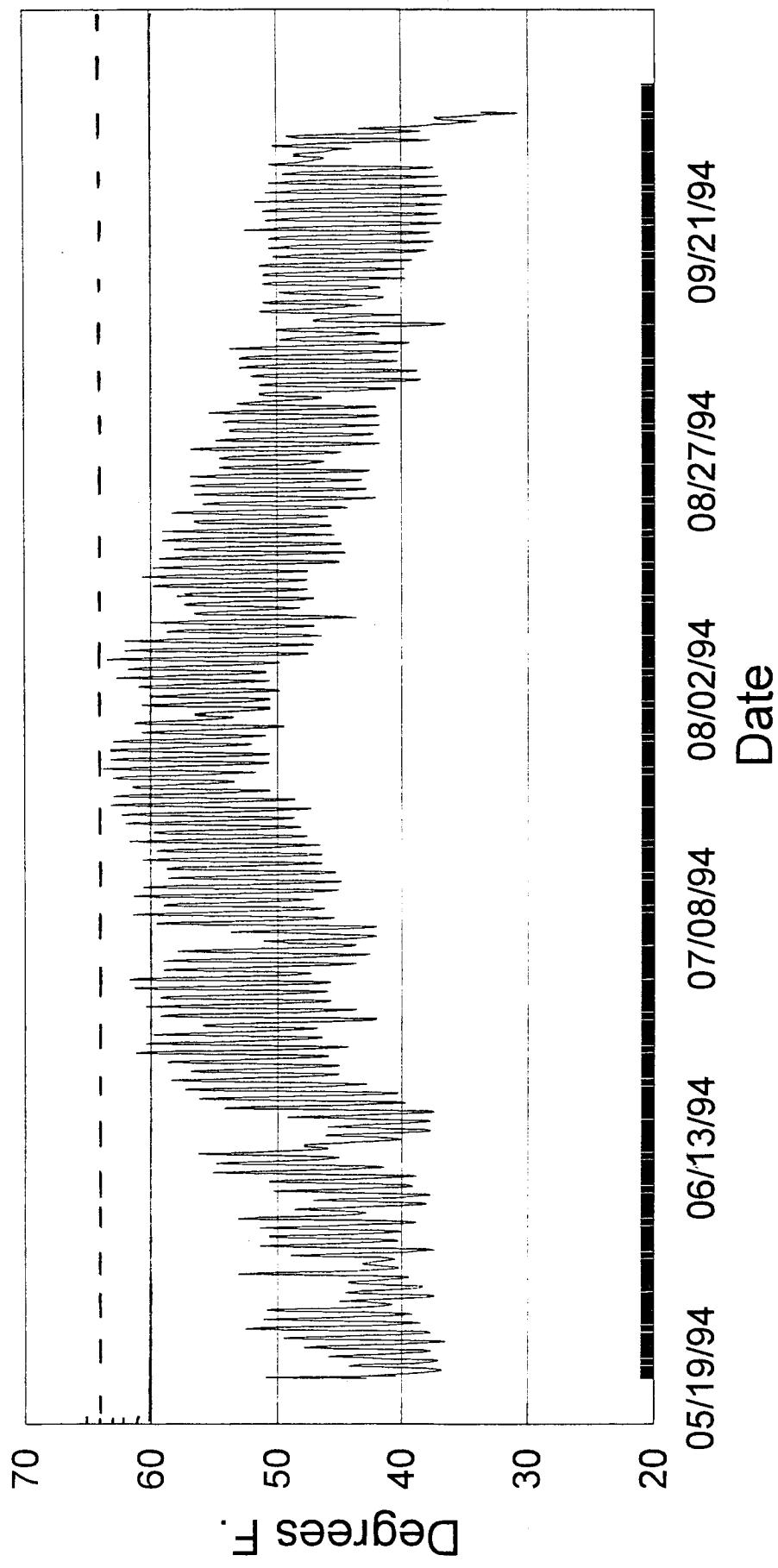
**Valley Creek Upstream of USGS Gauge  
1994 HOBO Temperatures**



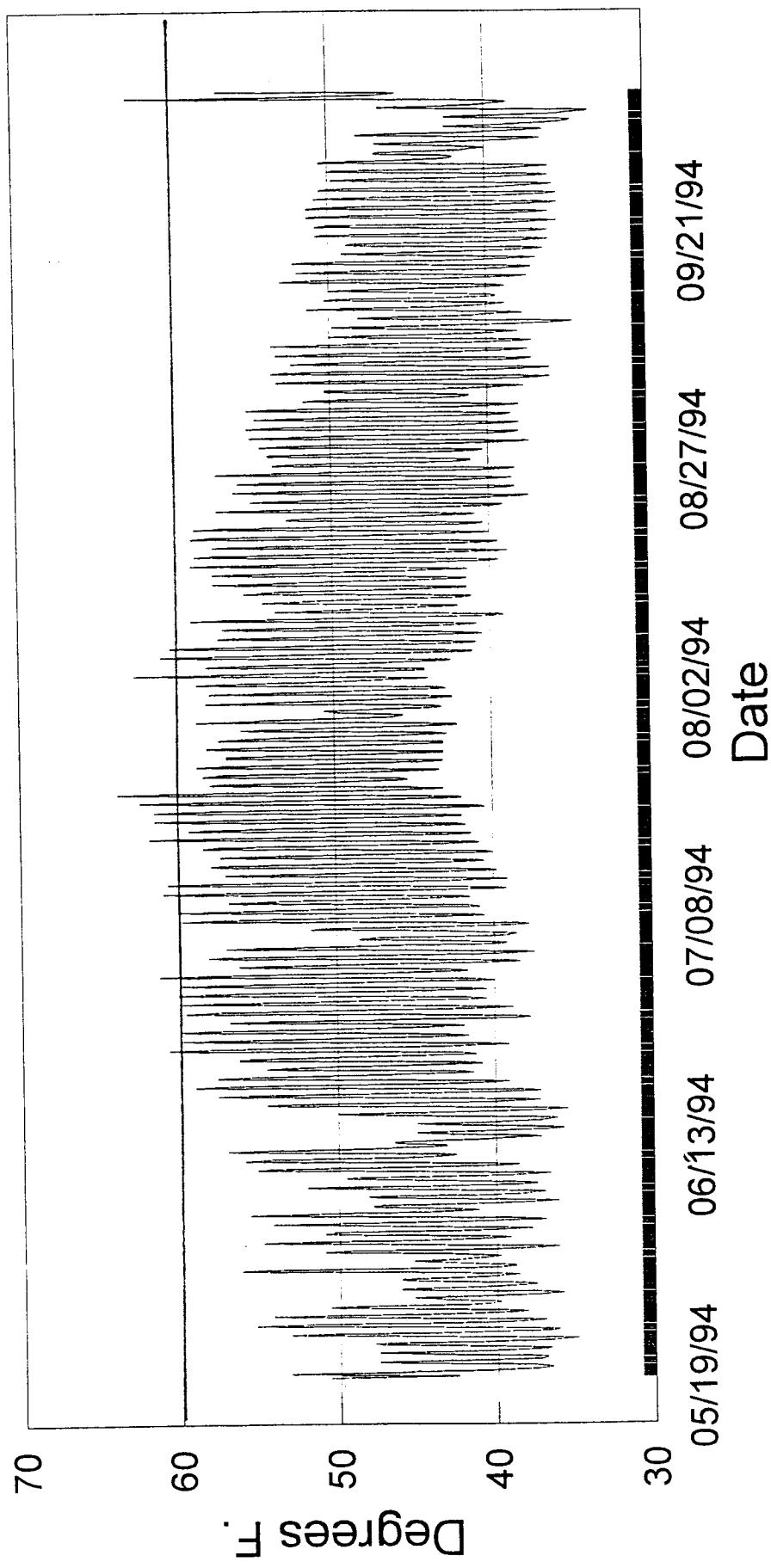
**Eightmile Creek  
1994 HOBO Temperatures**



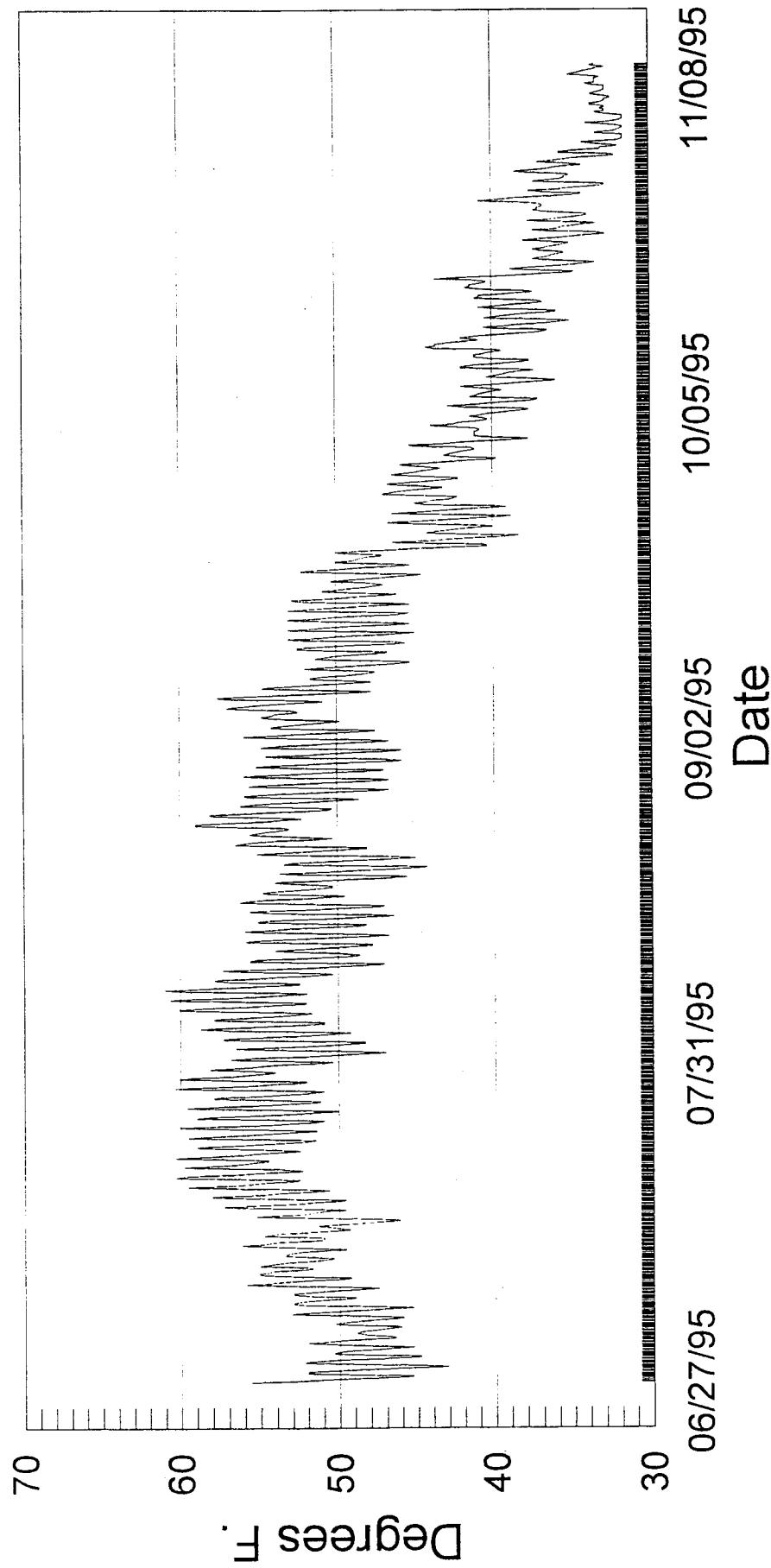
**West Fork Yankee Fork Salmon River  
1994 HOBO Temperatures**



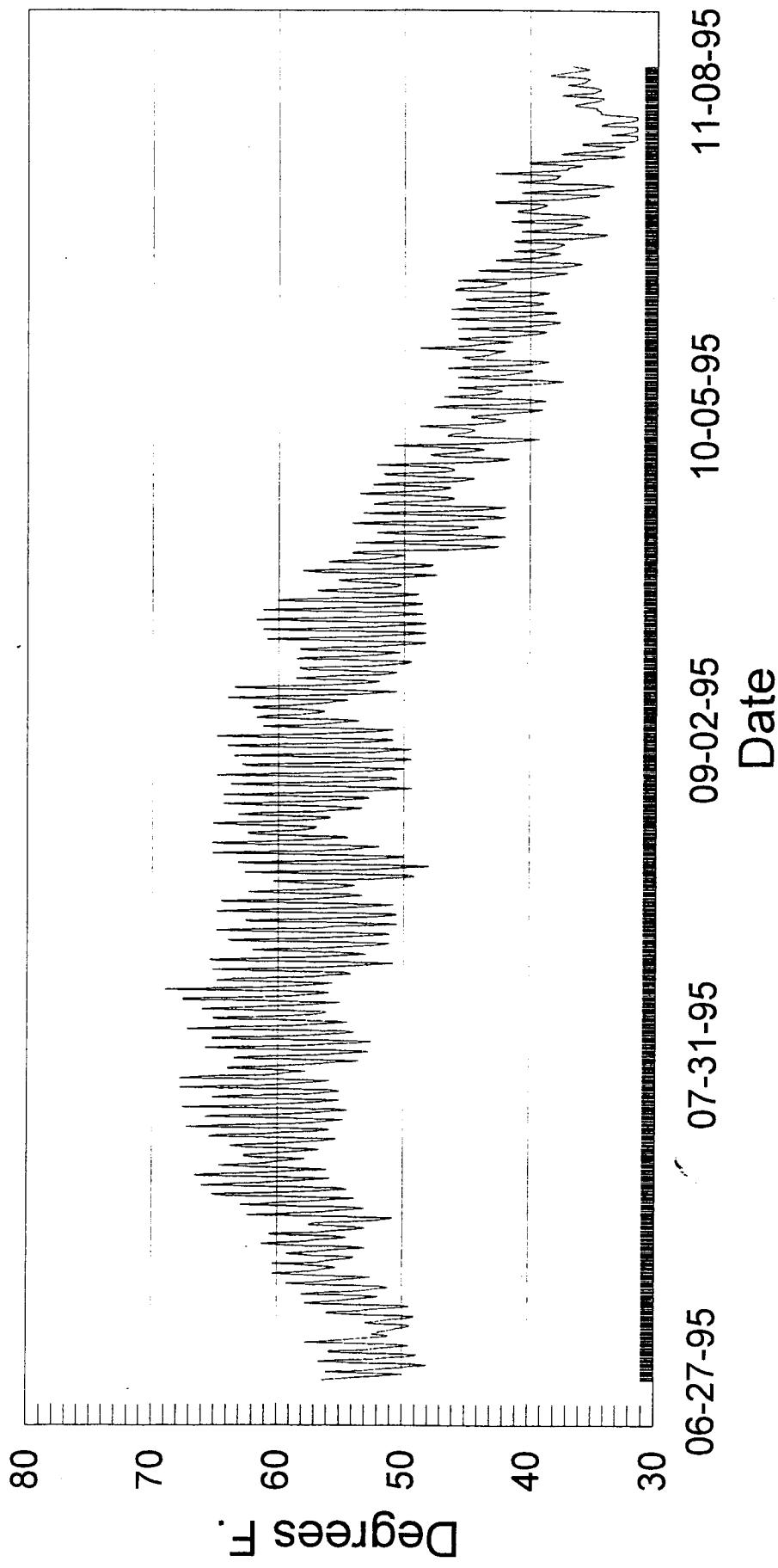
**Upper Yankee Fork Salmon River  
1994 HOBO Temperatures**



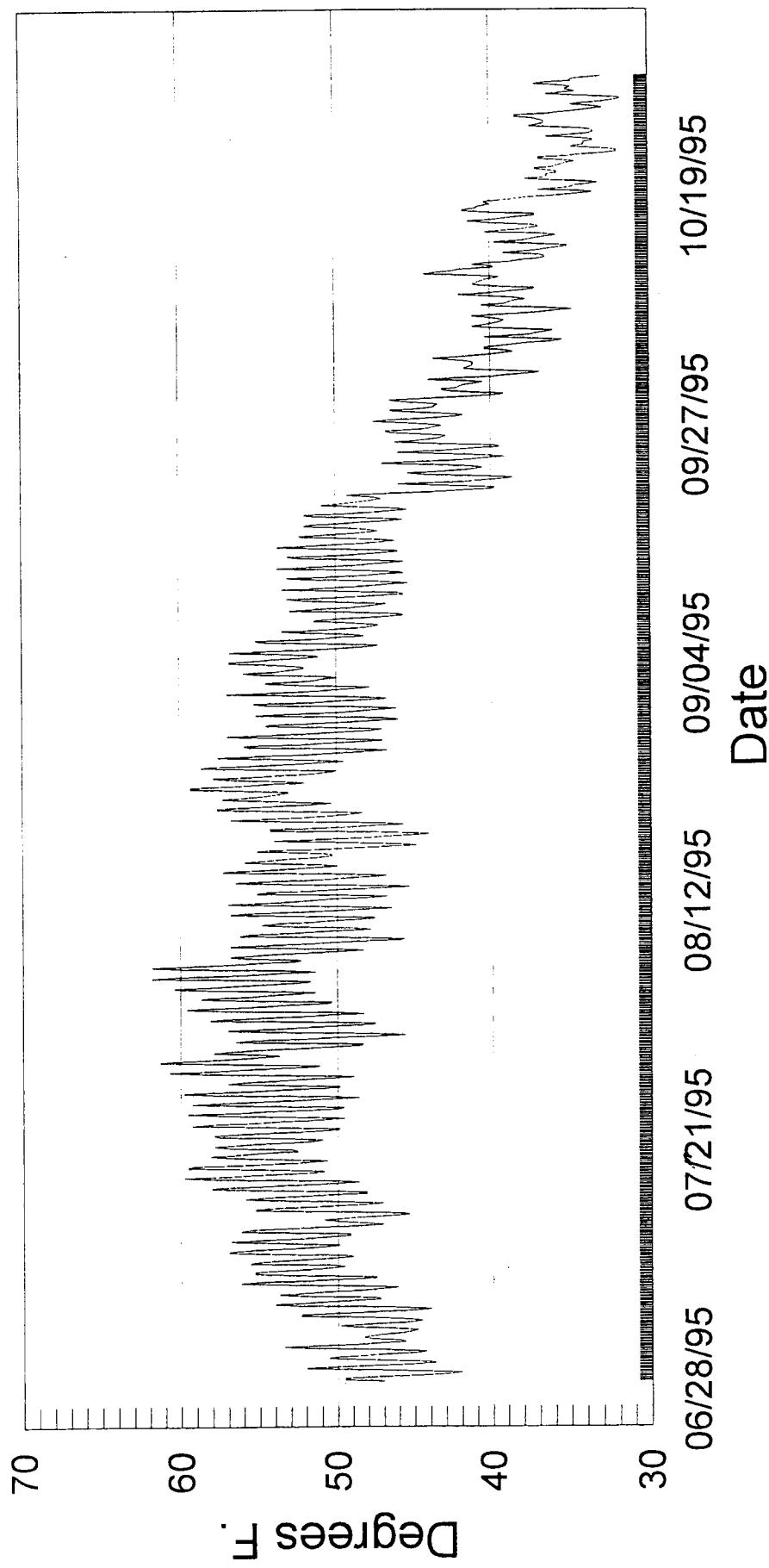
**Silver Creek above Beaver Ponds**  
**1995 HOBO Temperatures**



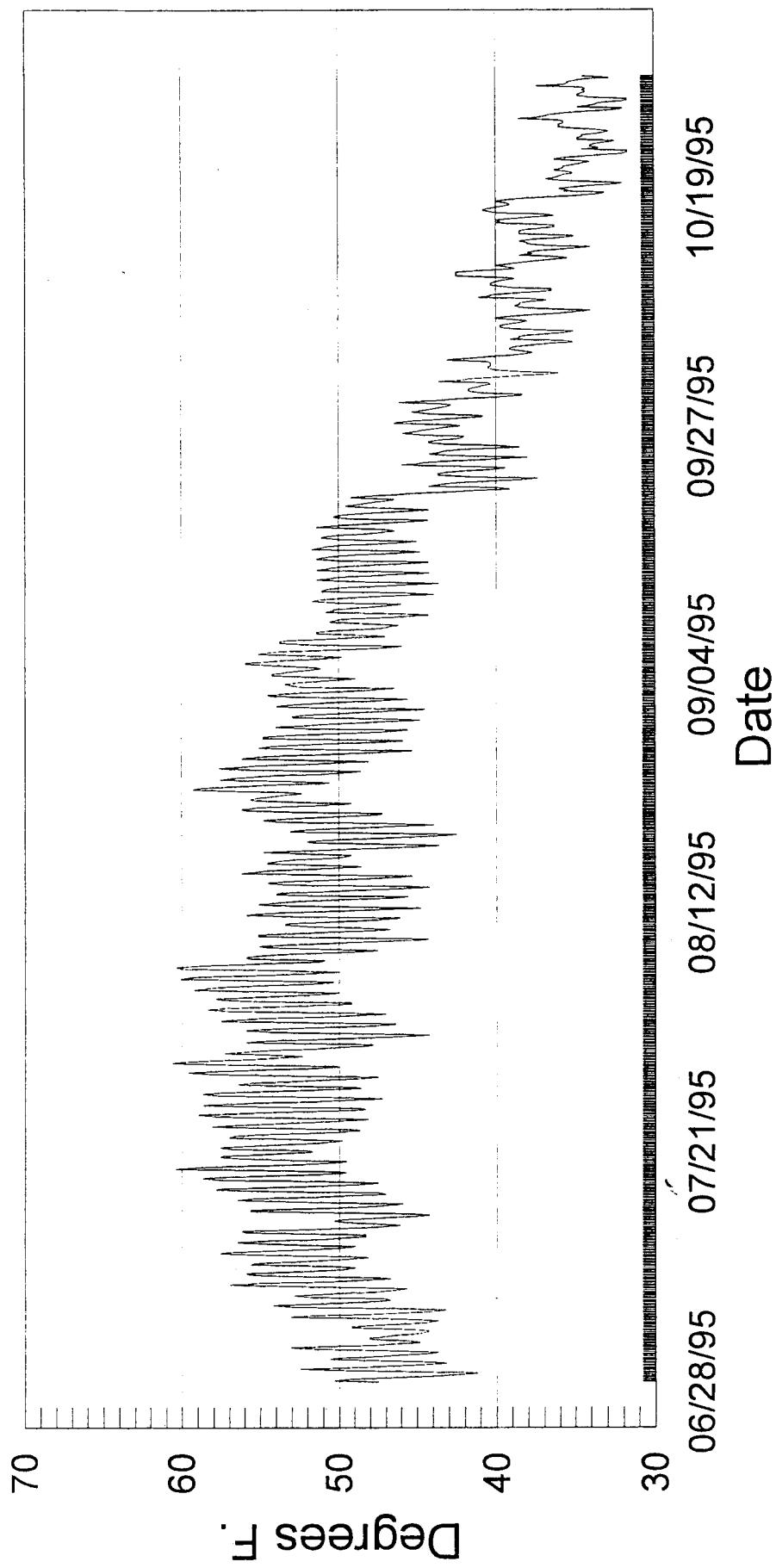
**Silver Creek below Lost Spring Campground**  
**1995 HOBO Temperatures**



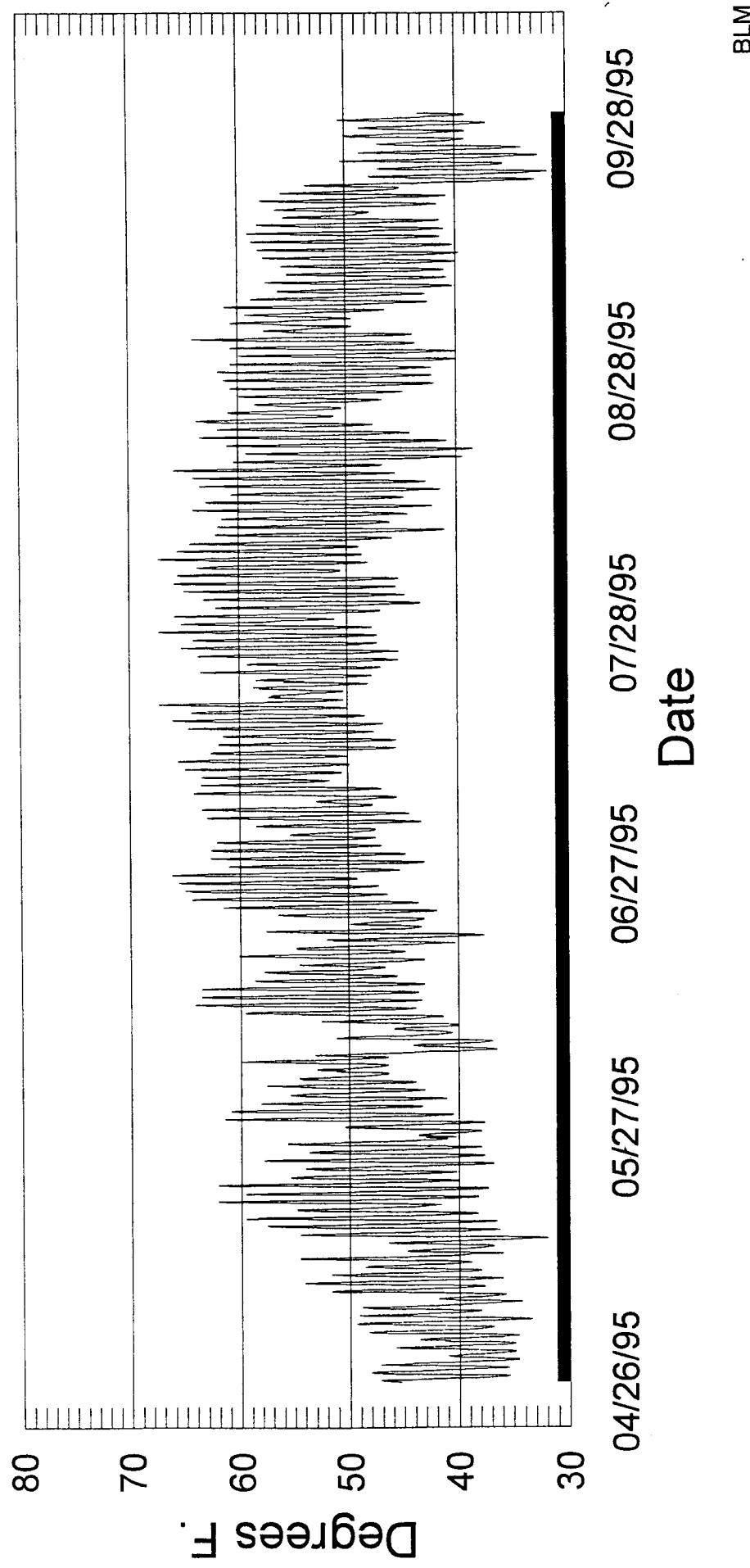
**Yellowjacket Creek above Lake Creek  
1995 HOBO Temperatures**



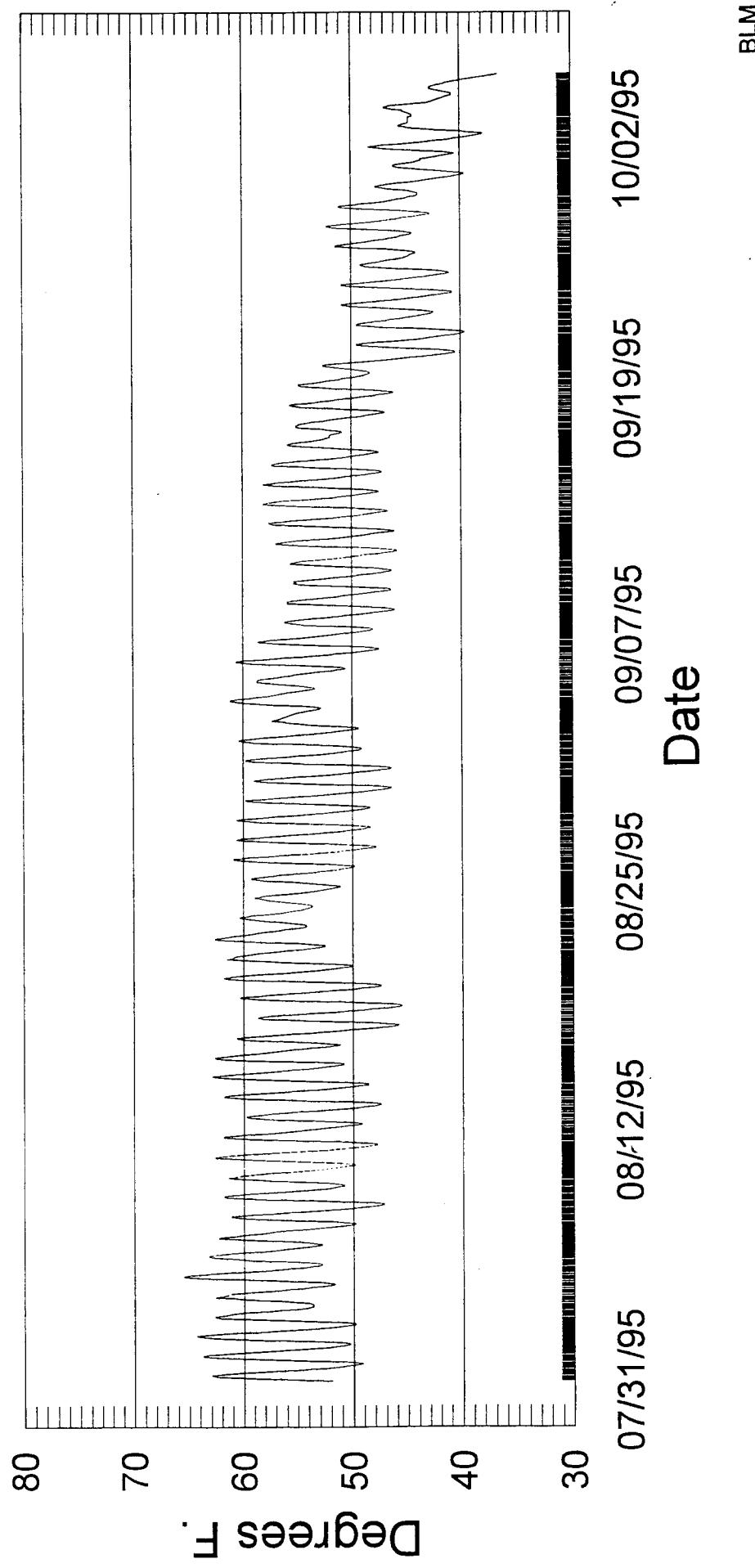
**Yellowjacket Creek above Tin Cup Mine**  
**1995 HOBO Temperatures**



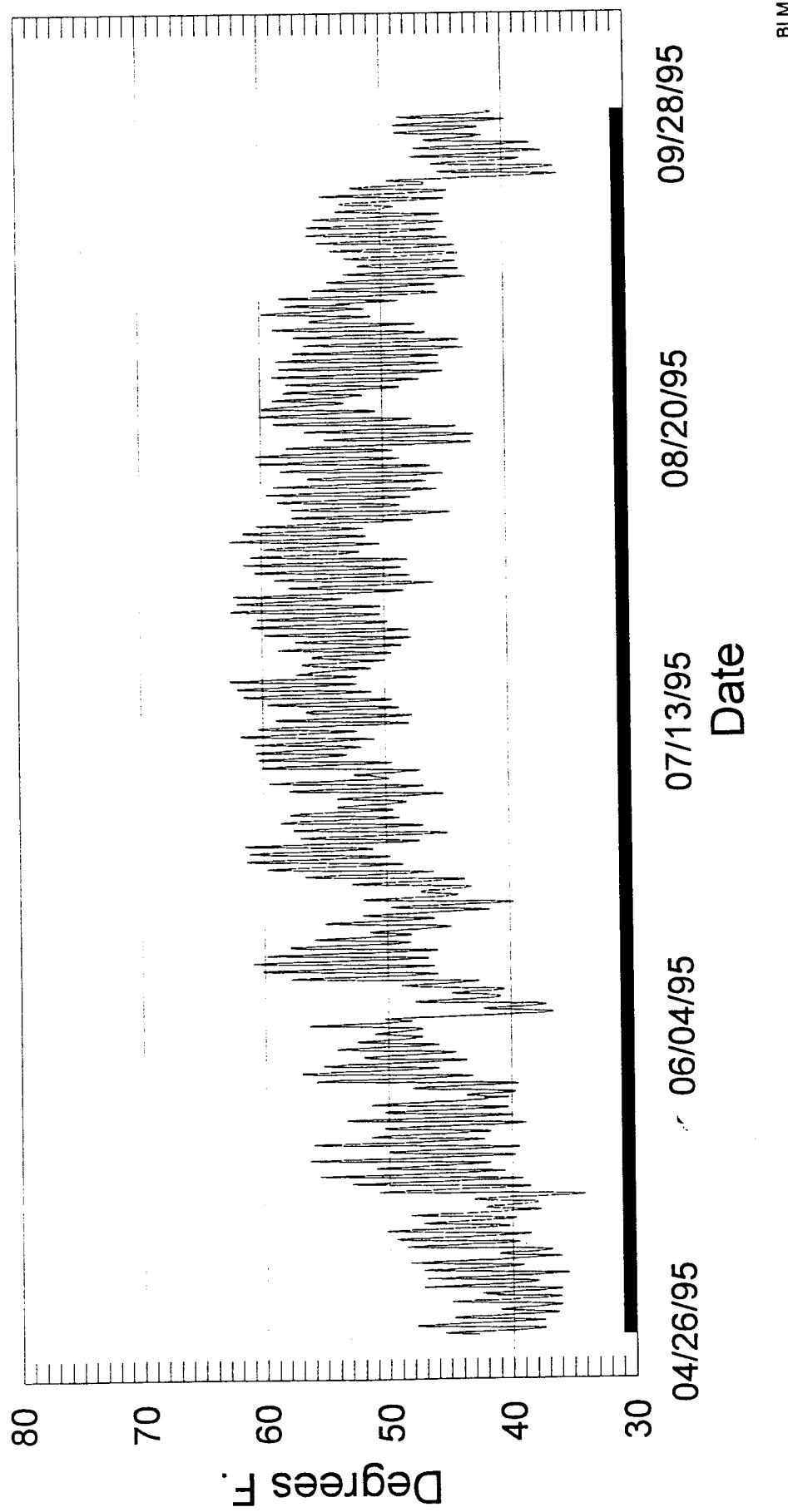
## Horse Basin Creek 1995 HOBO Temperatures



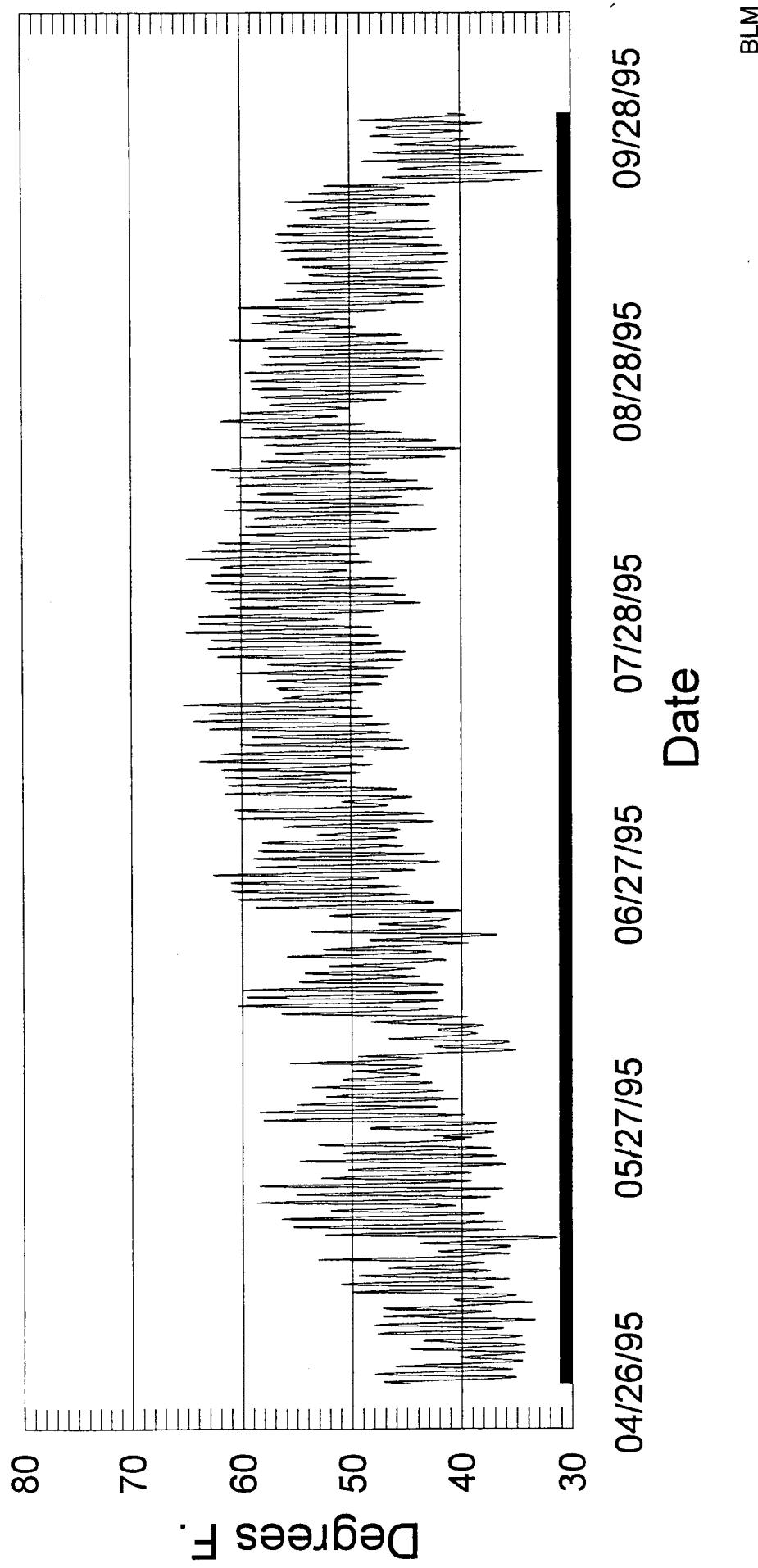
## Lake Creek near Mouth 1995 HOBO Temperatures



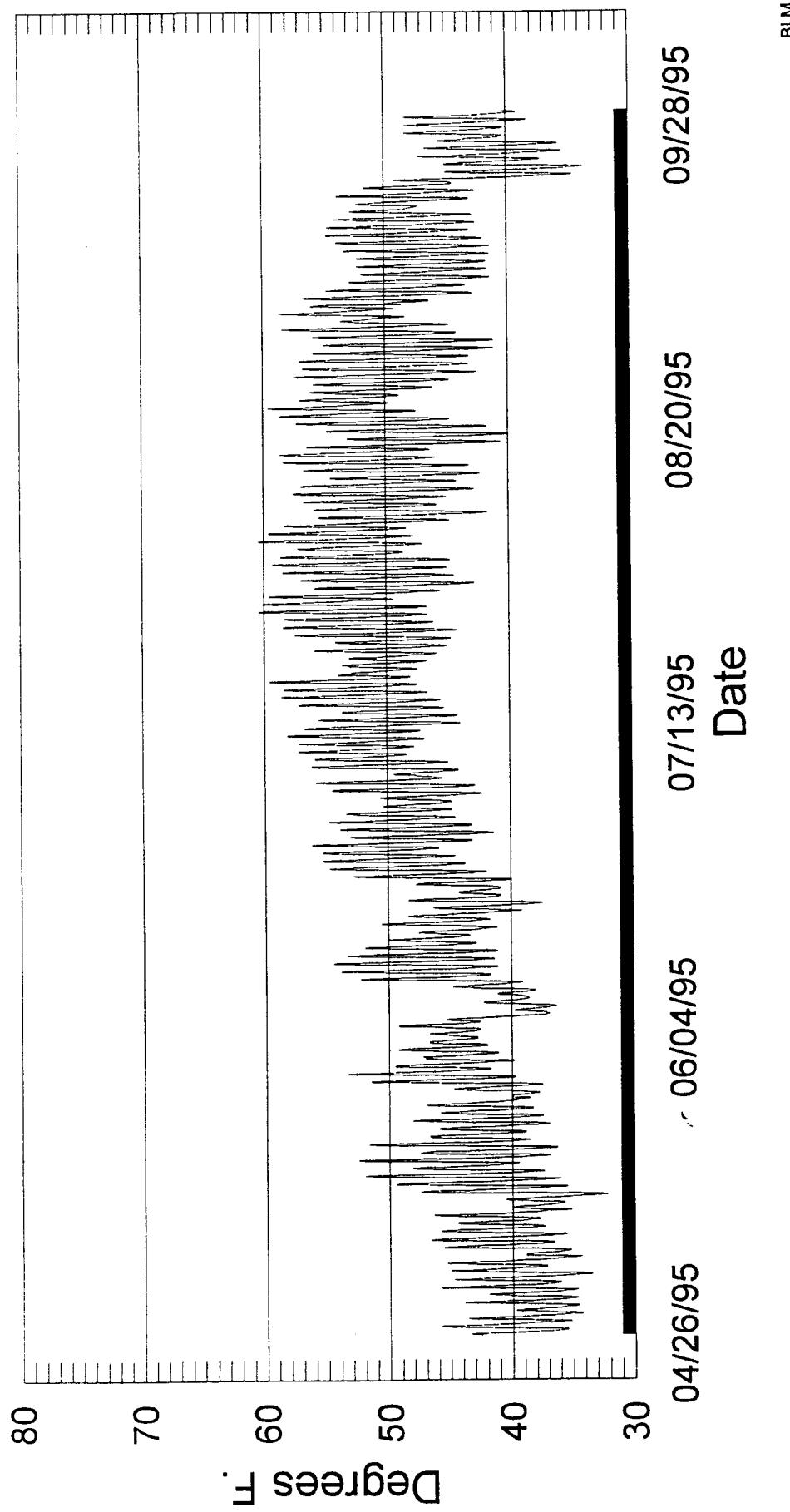
Road Creek above Bear Creek  
1995 HOBO Temperatures



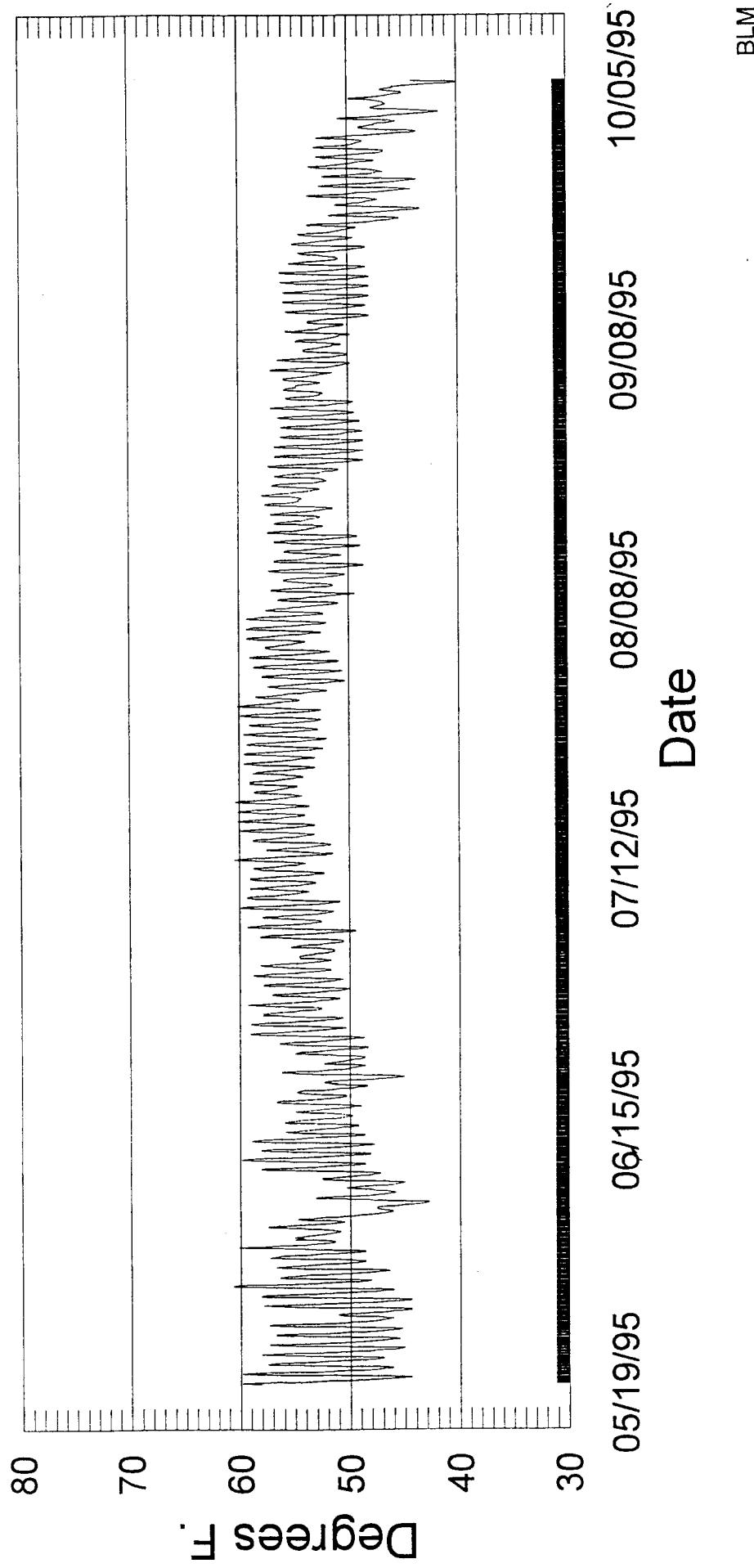
## Road Creek below Horse Basin Creek 1995 HOBO Temperatures



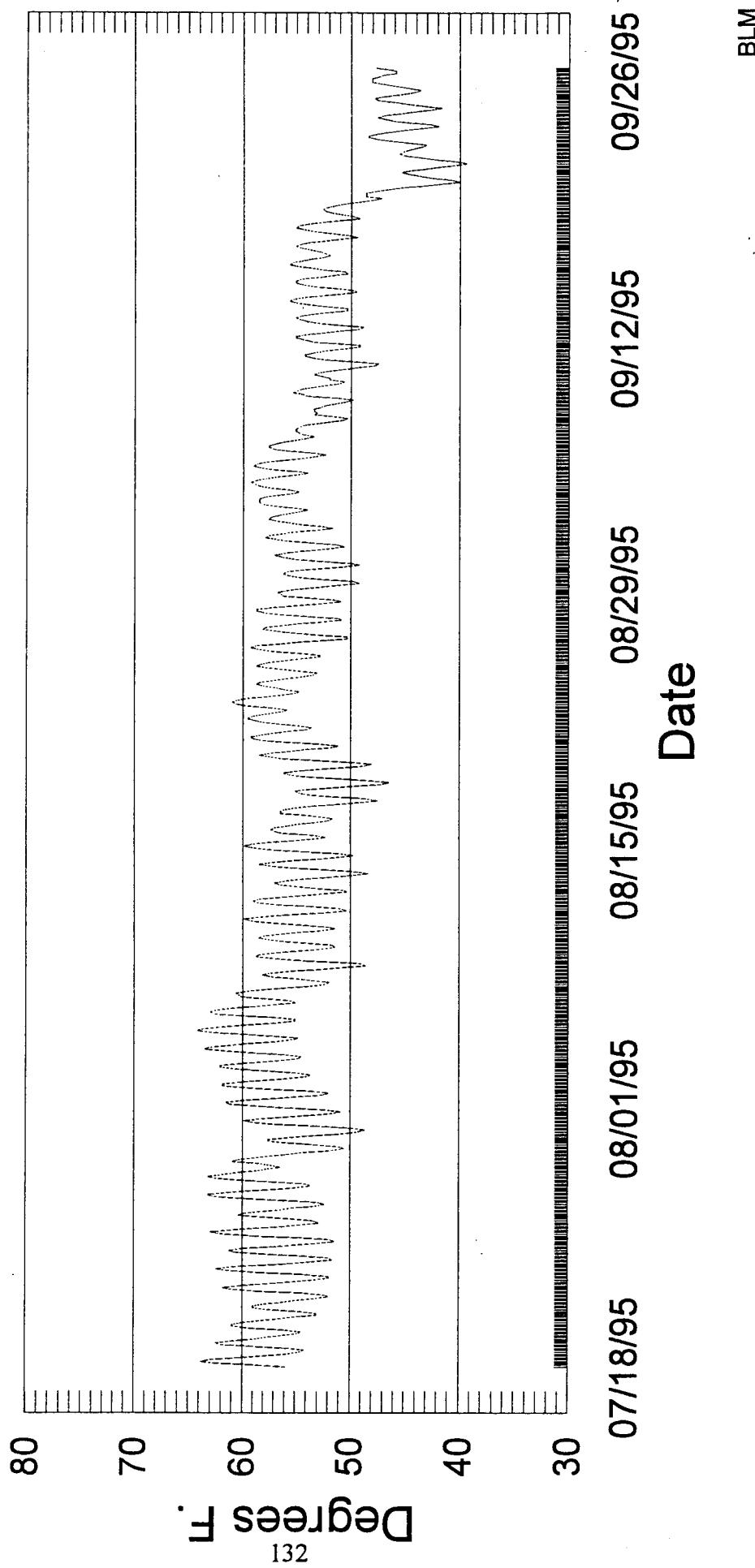
**Road Creek below Mosquito Creek**  
**1995 HOBO Temperatures**



## Little Hat Creek 1995 HOBO Temperatures

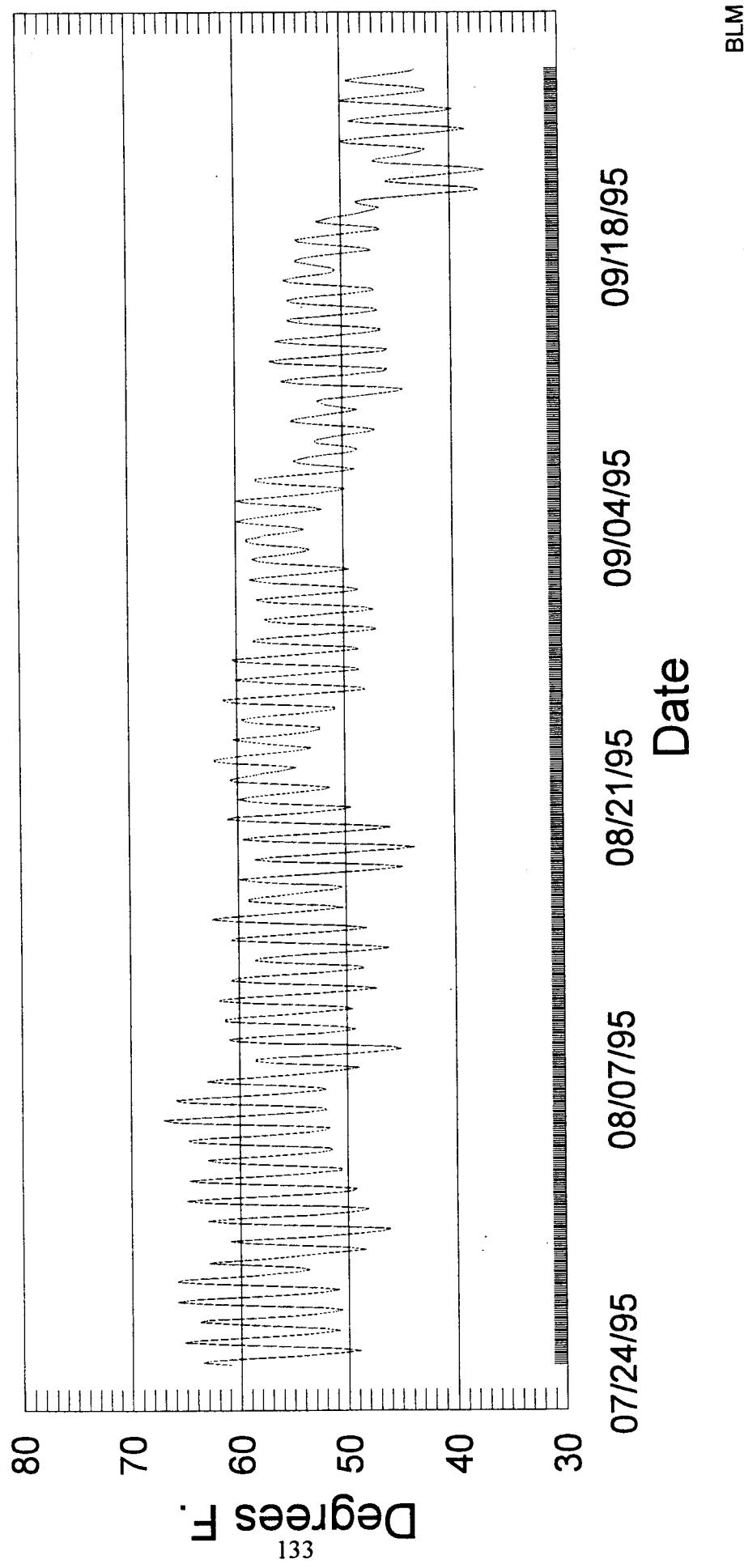


# Agency Creek Near Lower BLM Boundary 1995 HOBO Temperatures

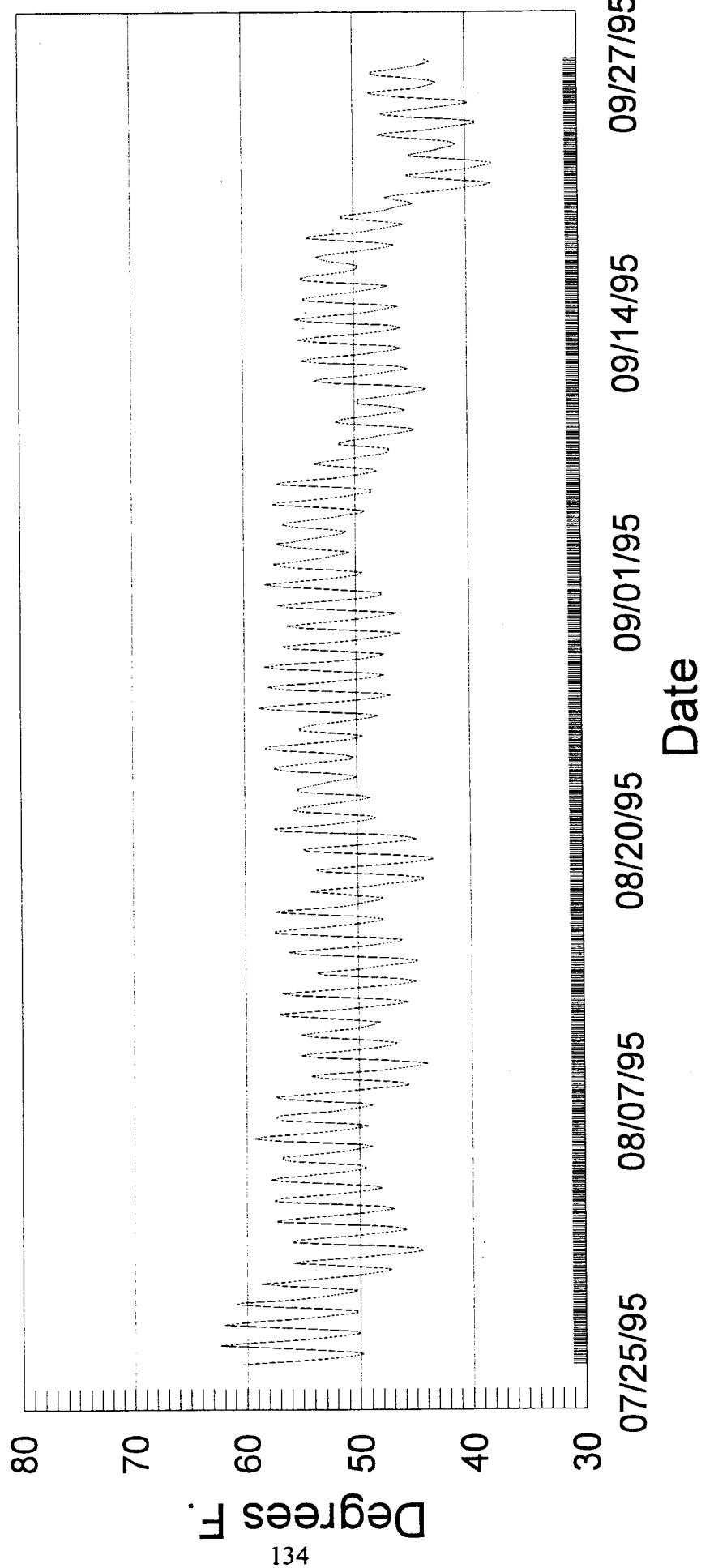


# Basin Creek in Hayden Creek Drainage

## 1995 HOBO Temperatures

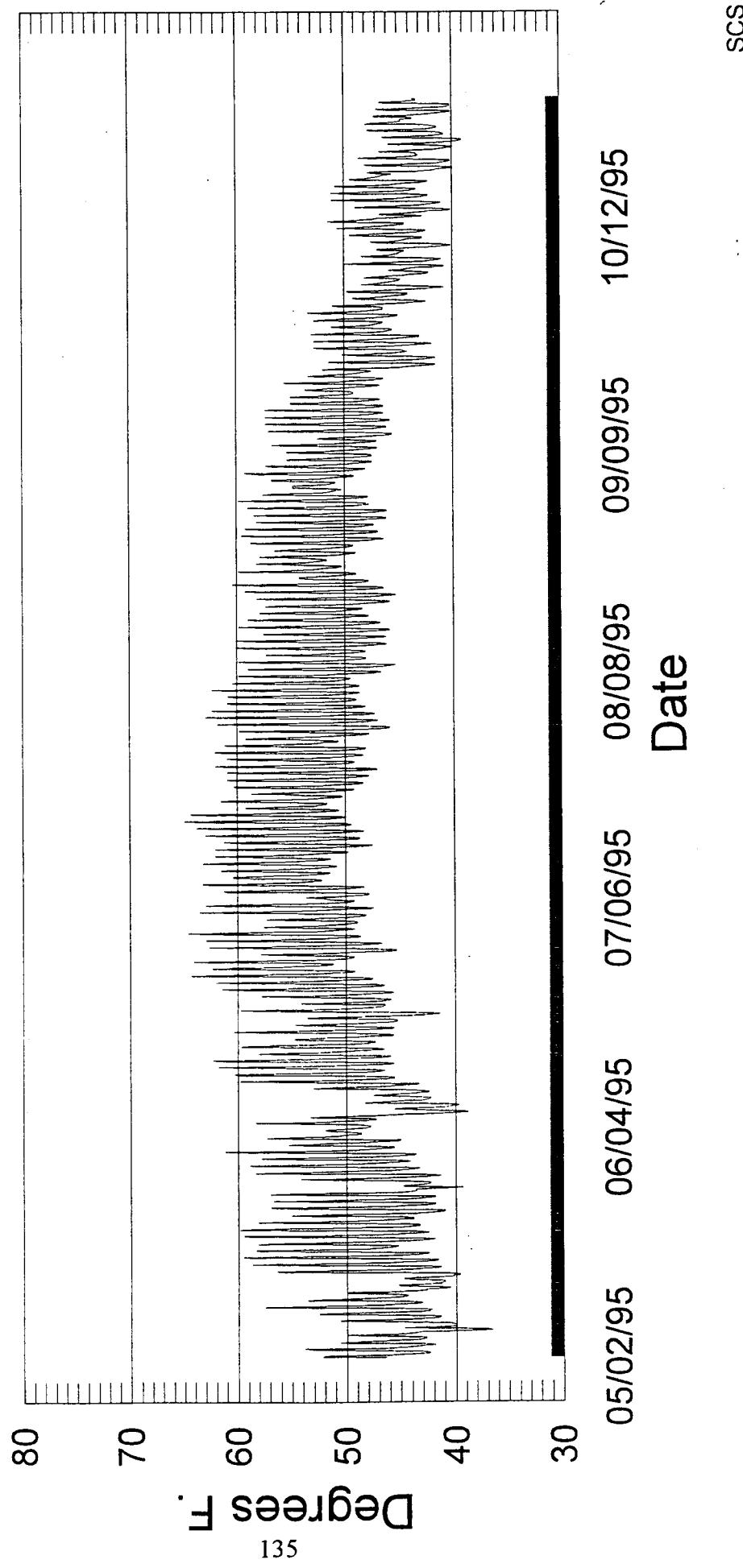


**Big Eightmile Creek above Lee Creek Road**  
**1995 HOBO Temperatures**

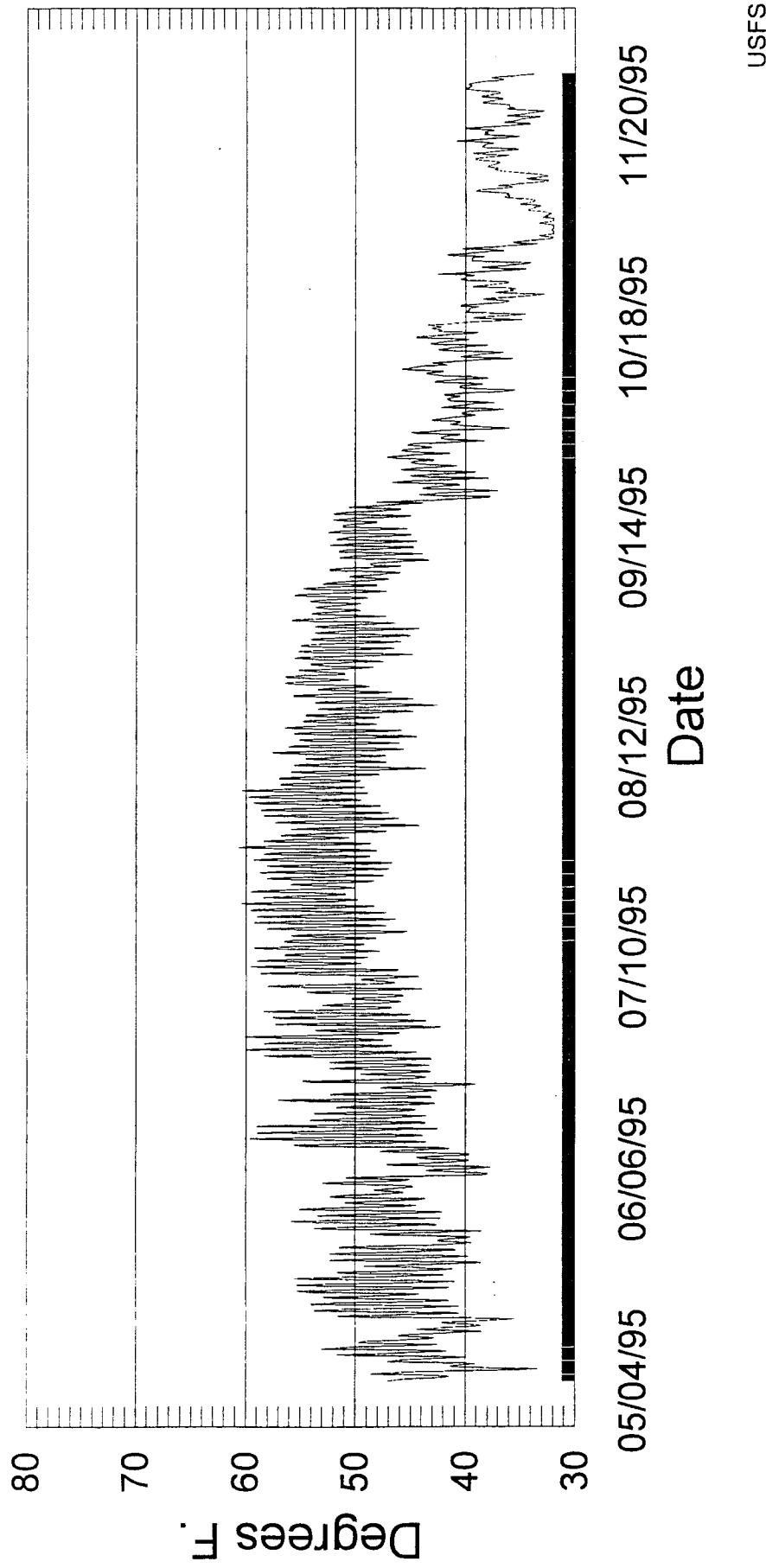


BLM

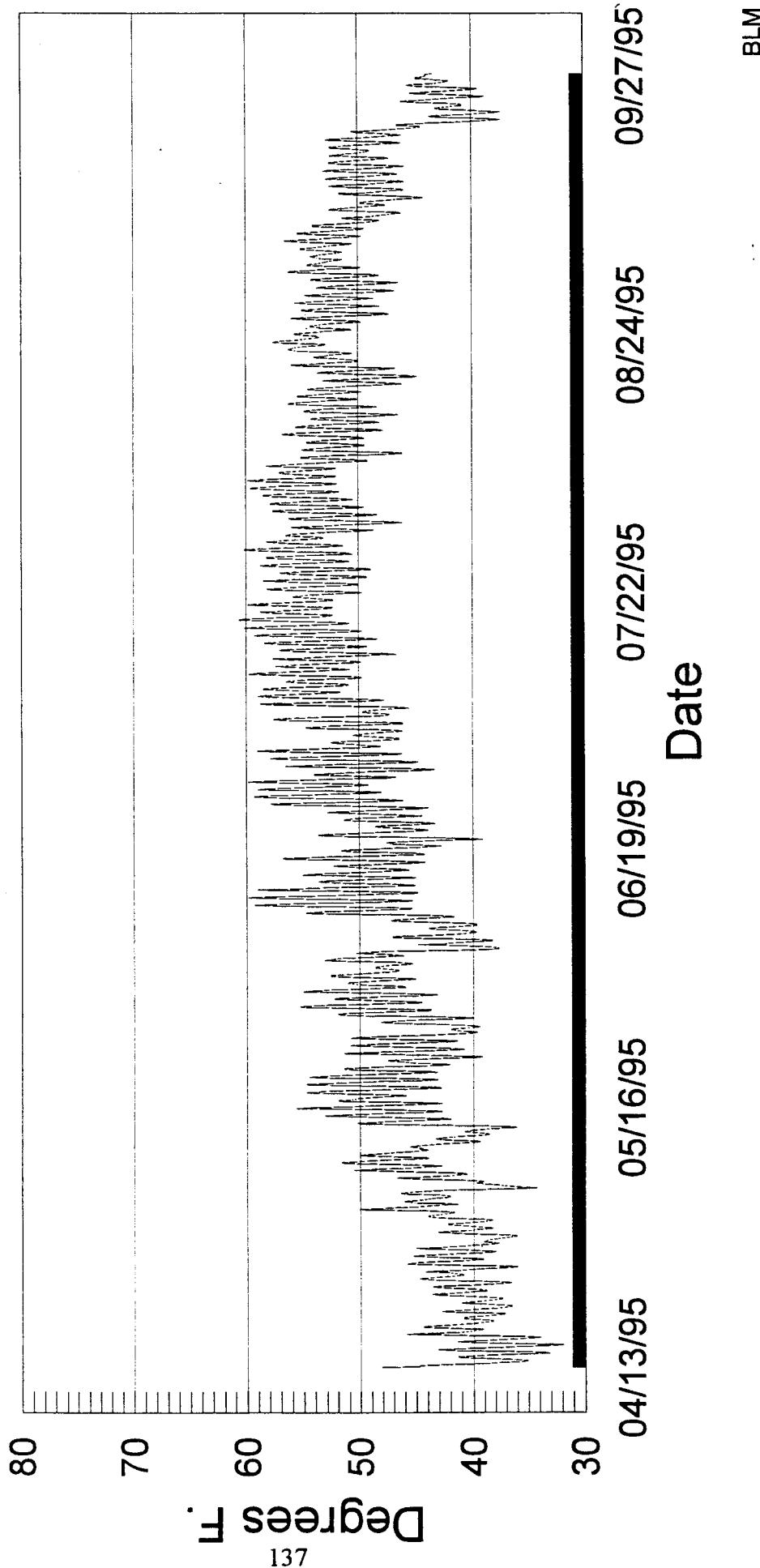
**Big Springs Creek near Old Fish & Game Weir**  
**1995 HOBO Temperatures**



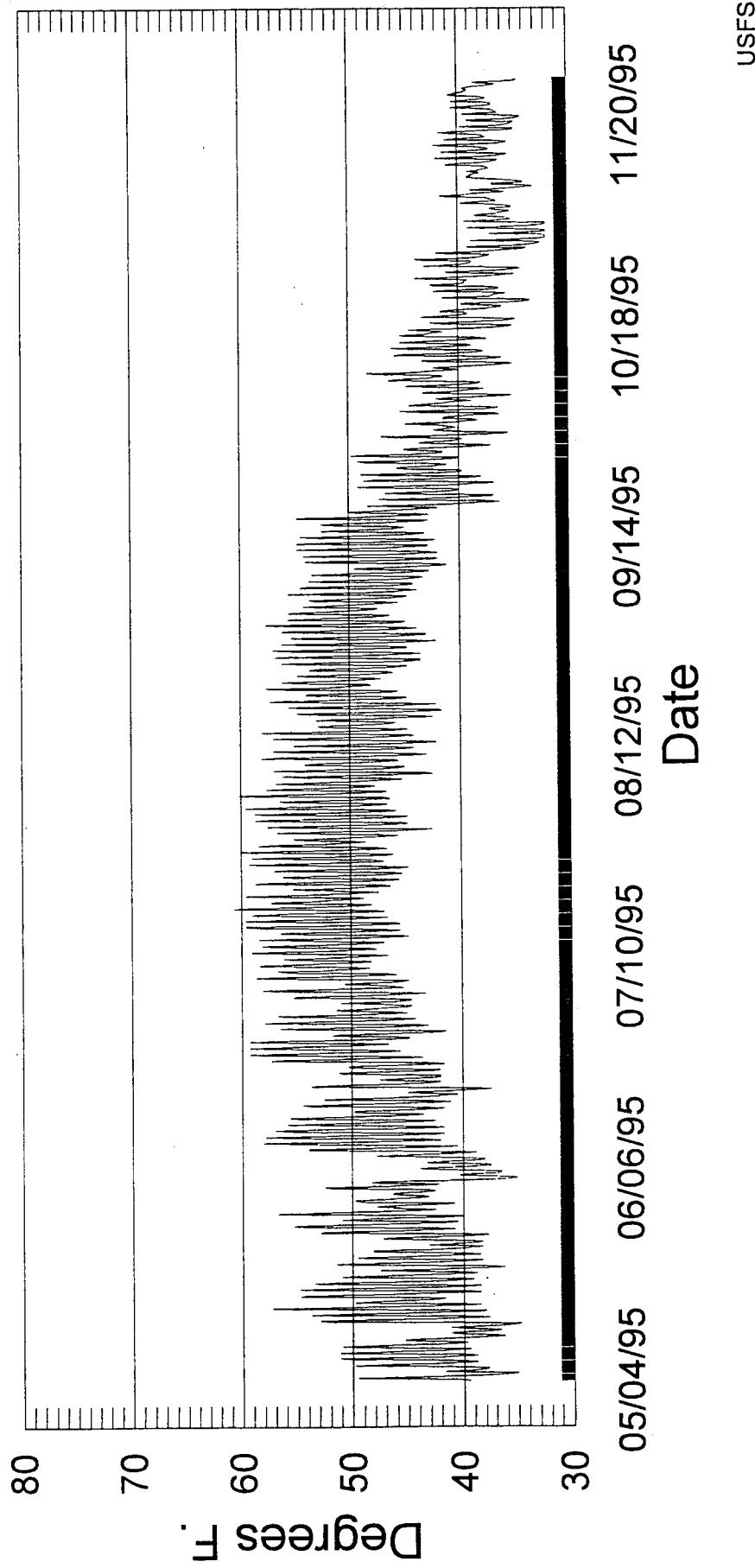
## Canyon Creek 1995 HOBO Temperatures



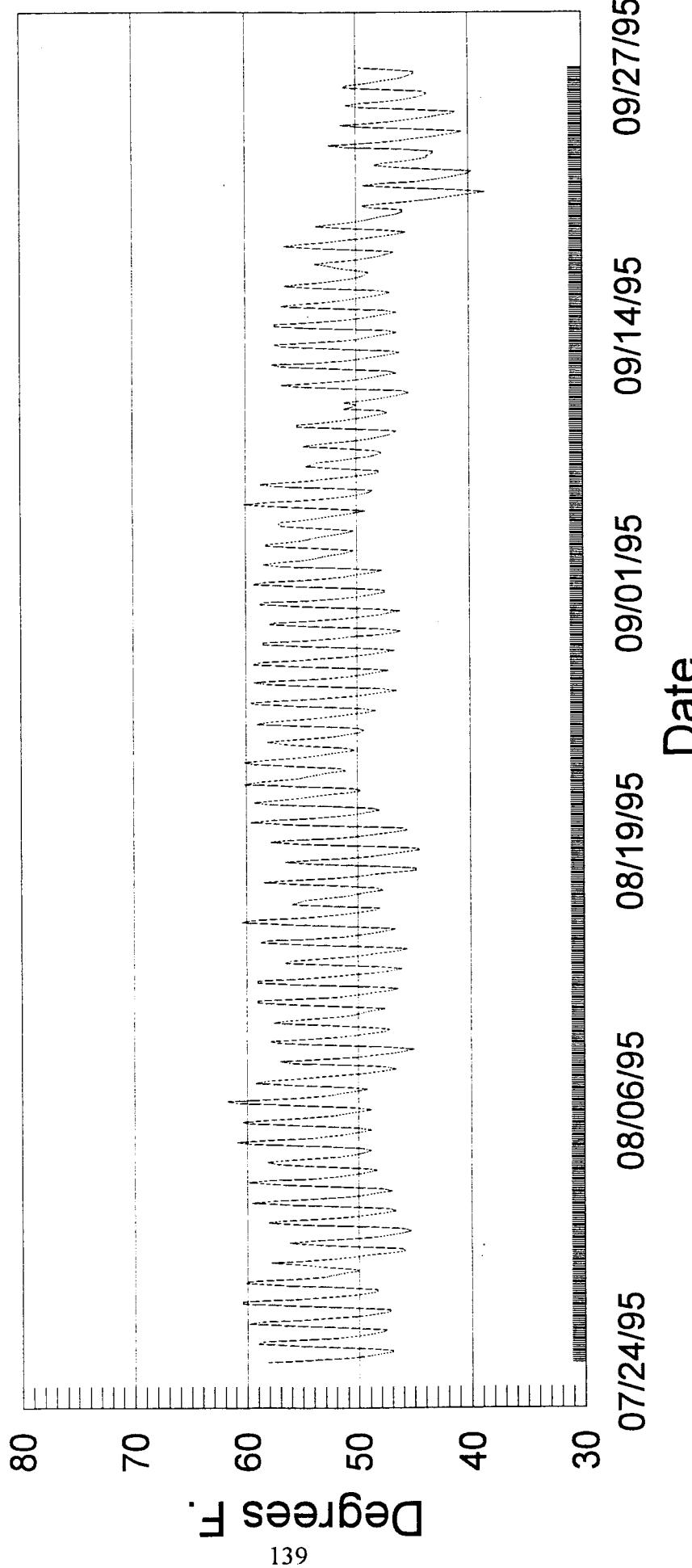
## Canyon Creek above Lower BLM Boundary 1995 HOBO Temperatures



## Hawley Creek 1995 HOBO Temperatures

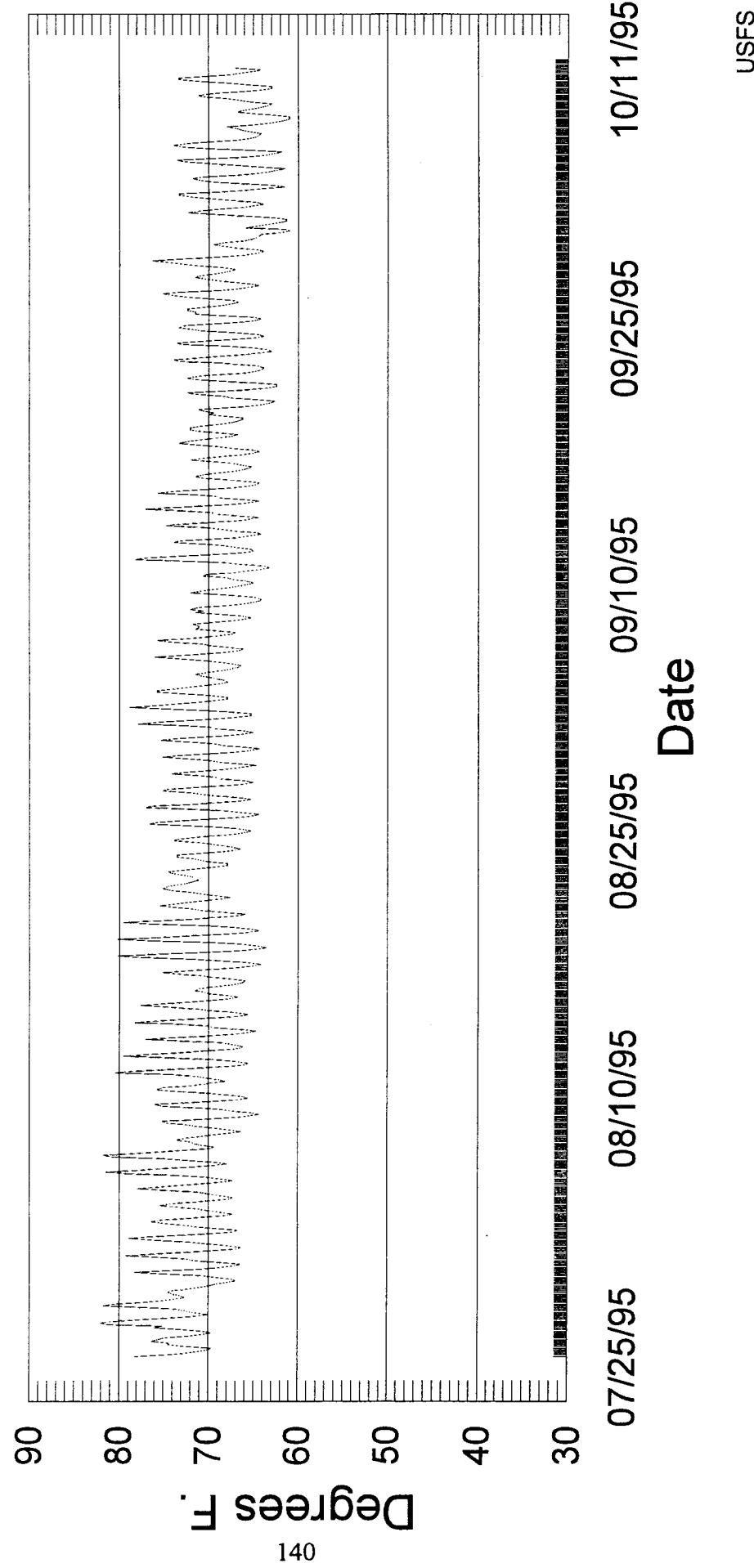


**Haynes Creek**  
**1995 HOBO Temperatures**



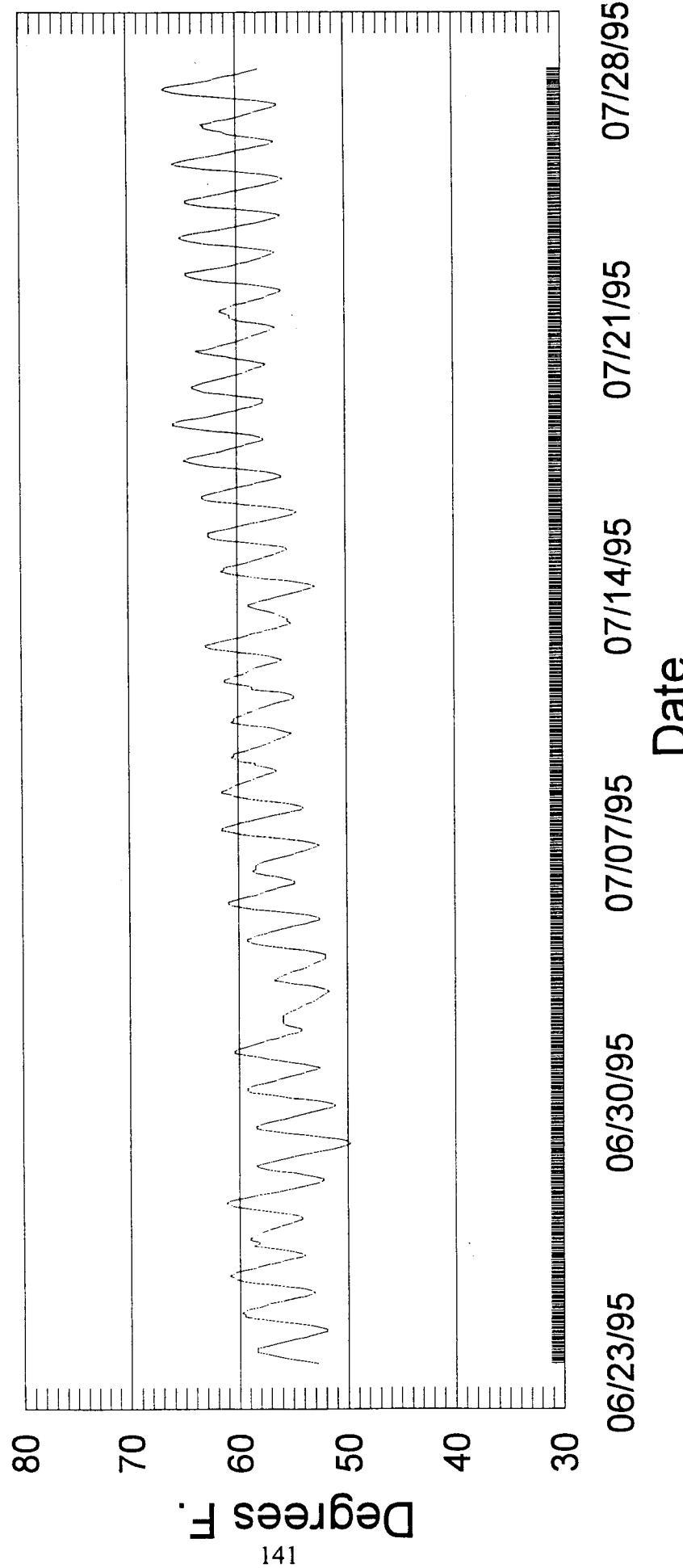
BLM

## Kenney Creek in Canyon 1995 HOBO Temperatures



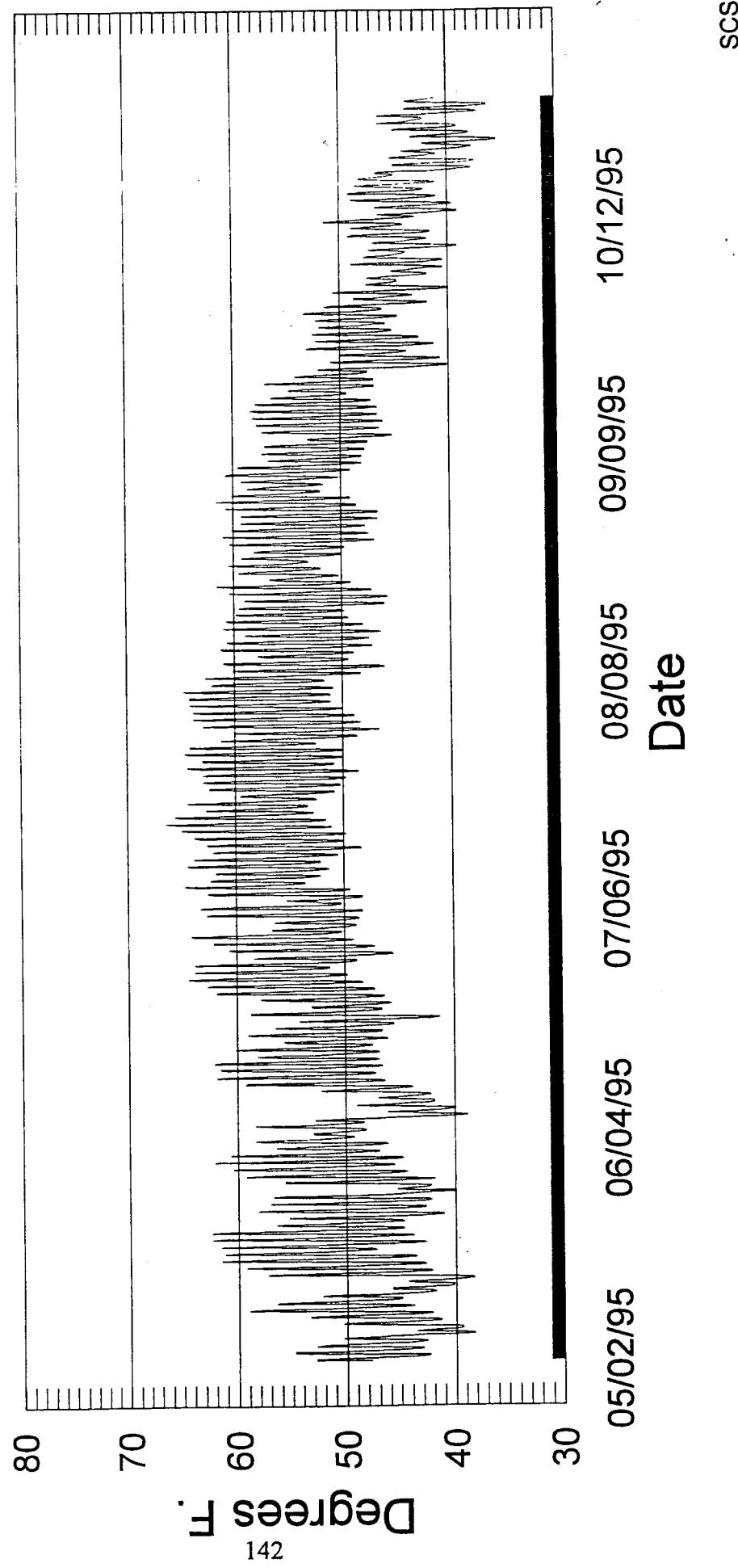
USFS

# Lemhi River 1995 HOBO Temperatures



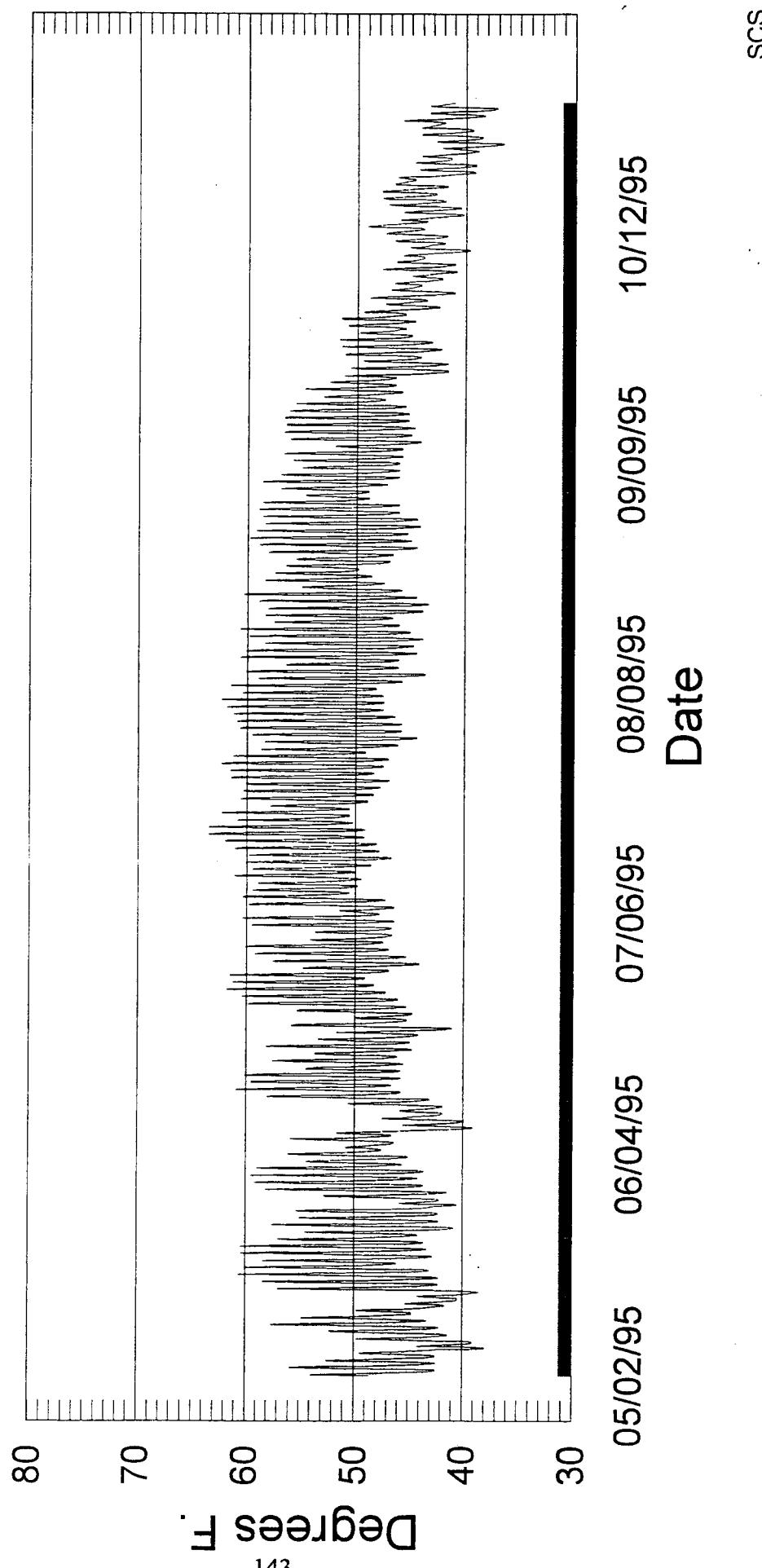
USFS

Lemhi River above Cottom Lane Bridge  
1995 HOBO Temperatures



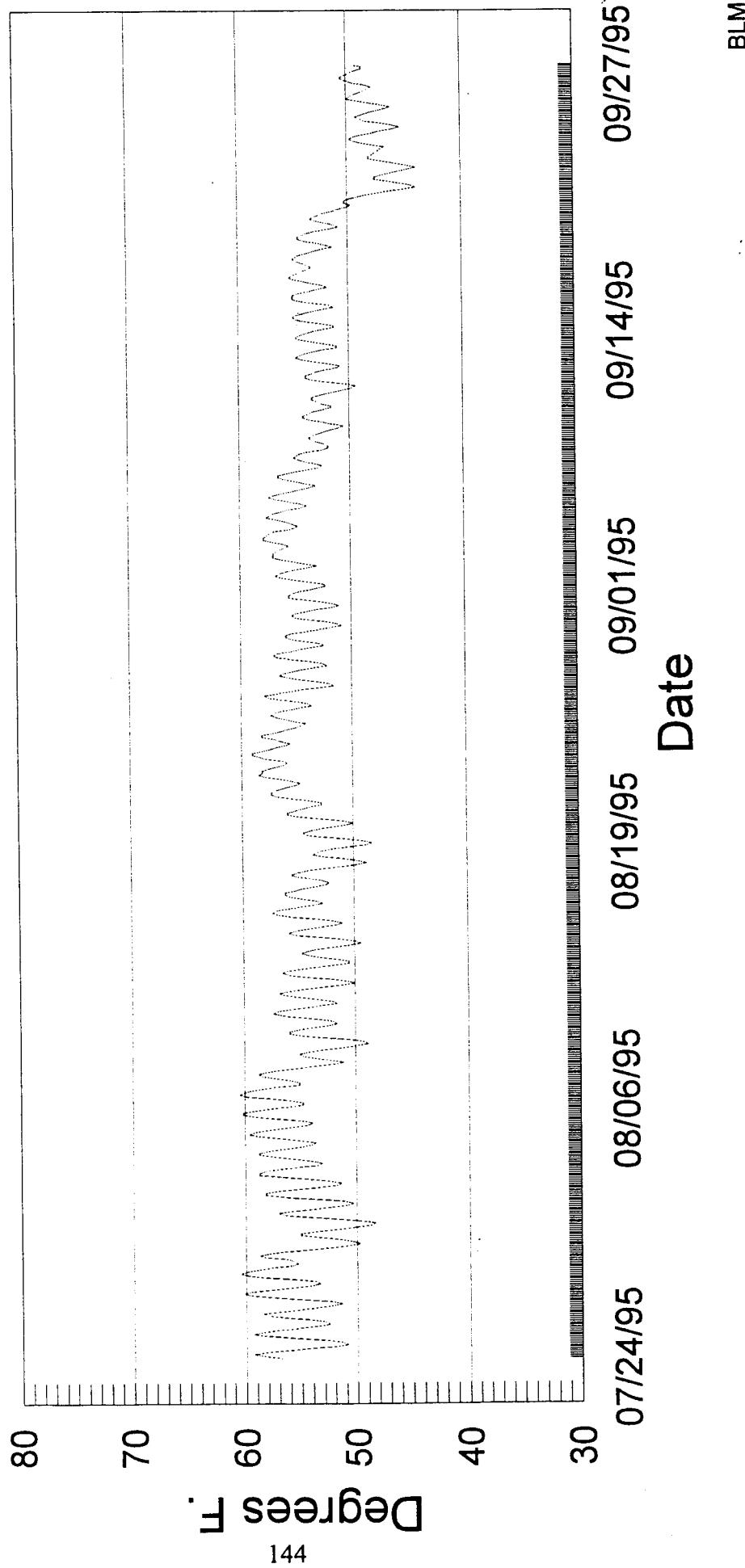
SCS

## Lemhi Below L59 Diversion 1995 HOBO Temperatures



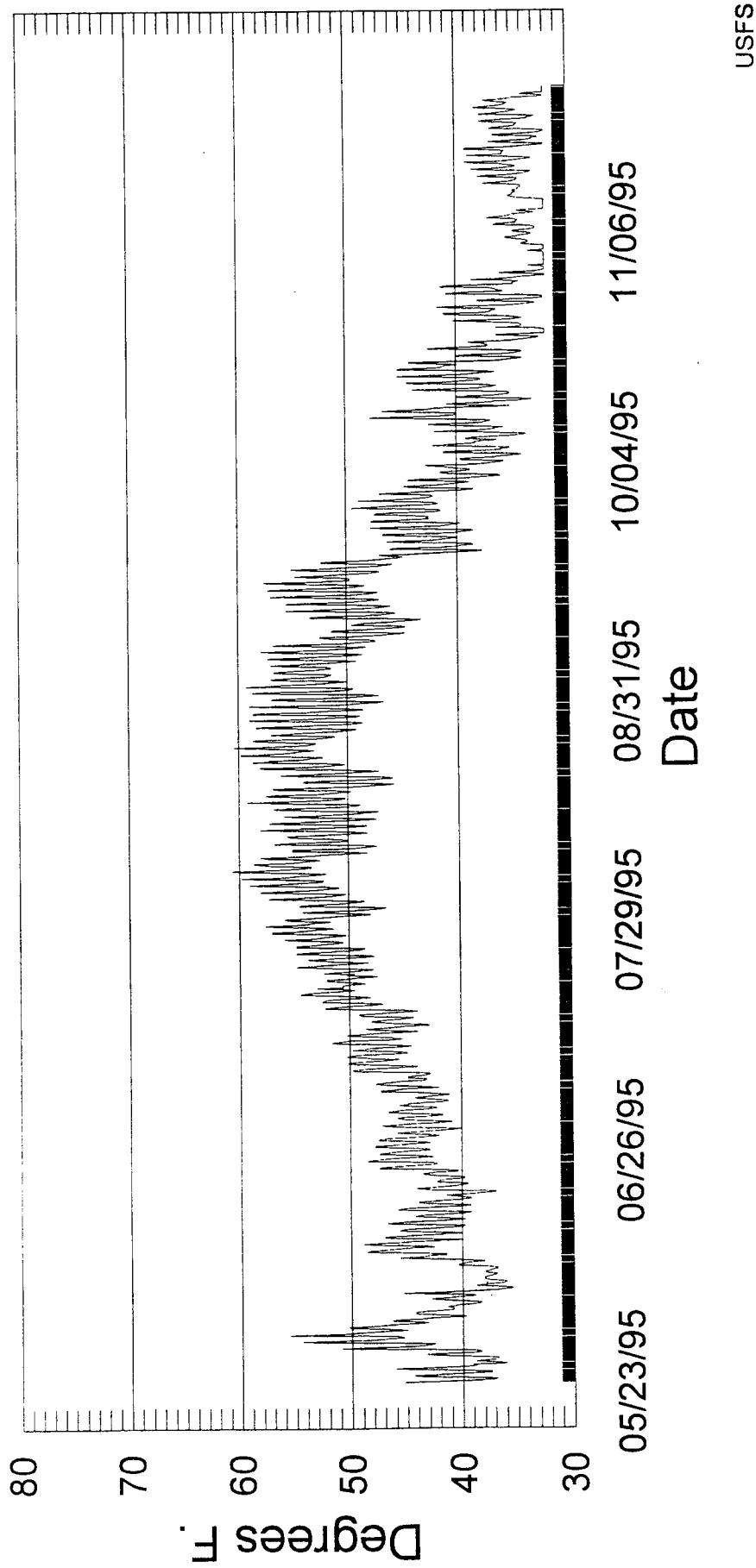
# McDevitt Creek near Old Cabins

## 1995 HOBO Temperatures

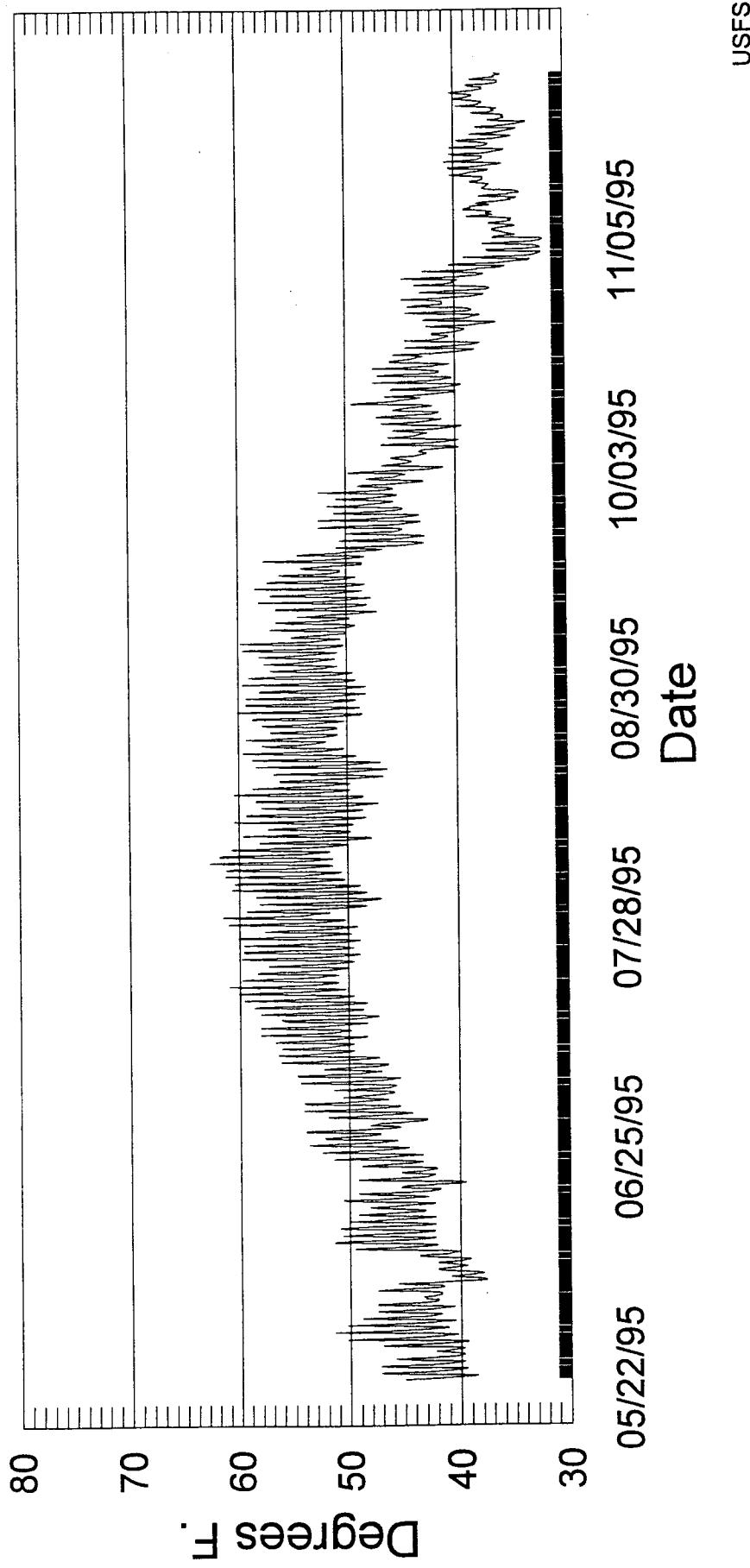


BLM

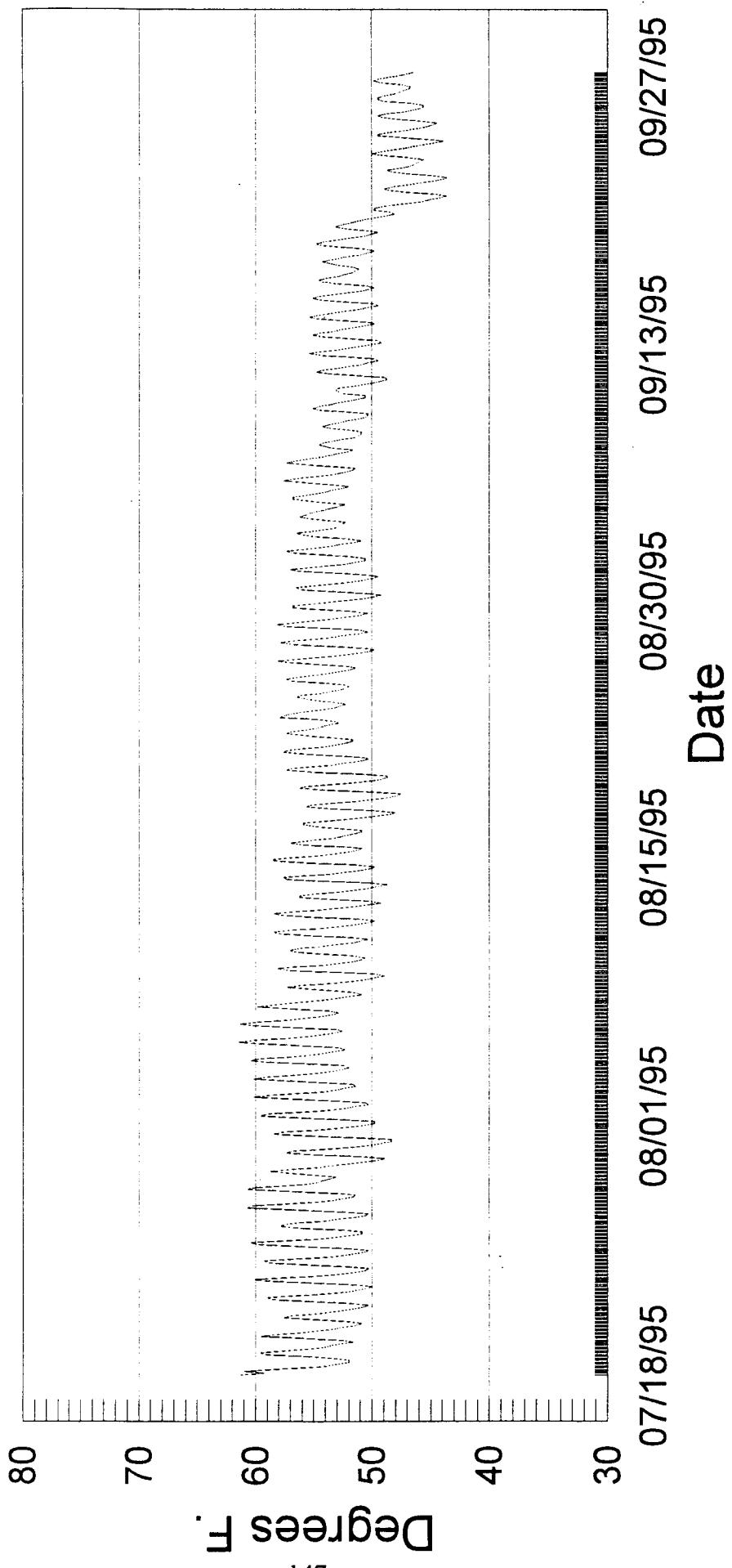
## Middle Fork Little Timber Creek 1995 HOBO Temperatures



**Pattie Creek**  
**1995 HOBO Temperatures**

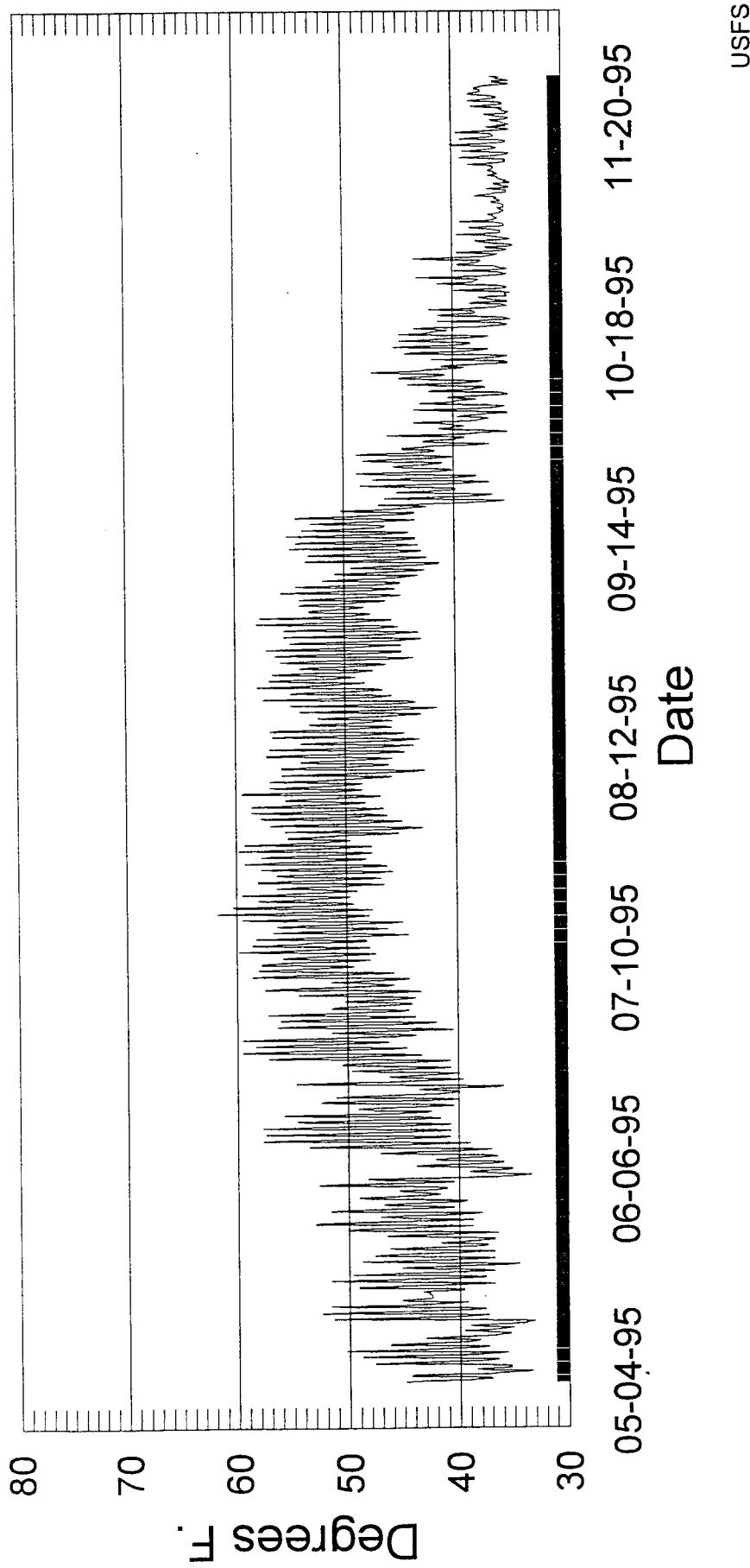


# Pattee Creek below Habitat Improvement Project Fence 1995 HOBO Temperatures



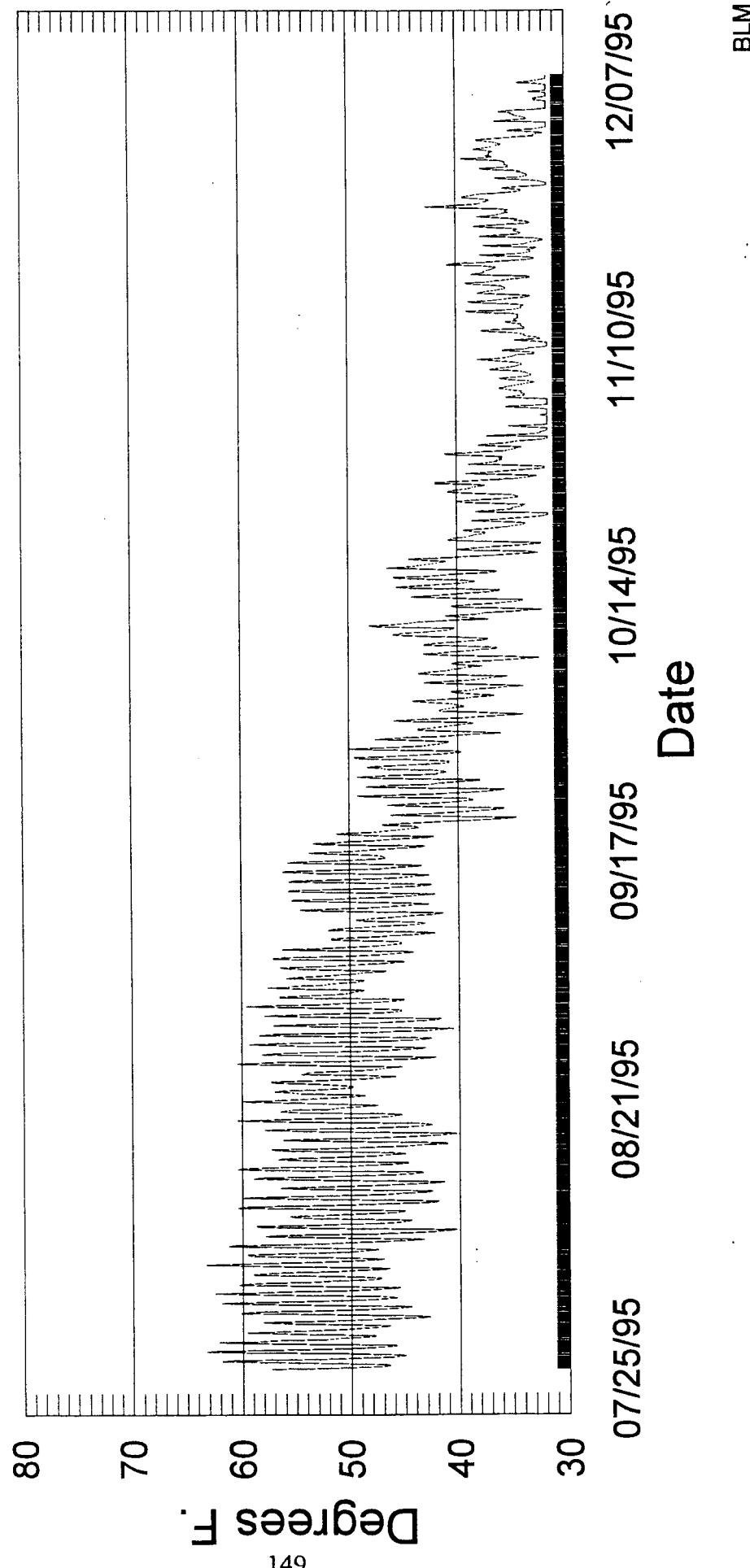
BLM

## Reservoir Creek 1995 HOBO Temperatures



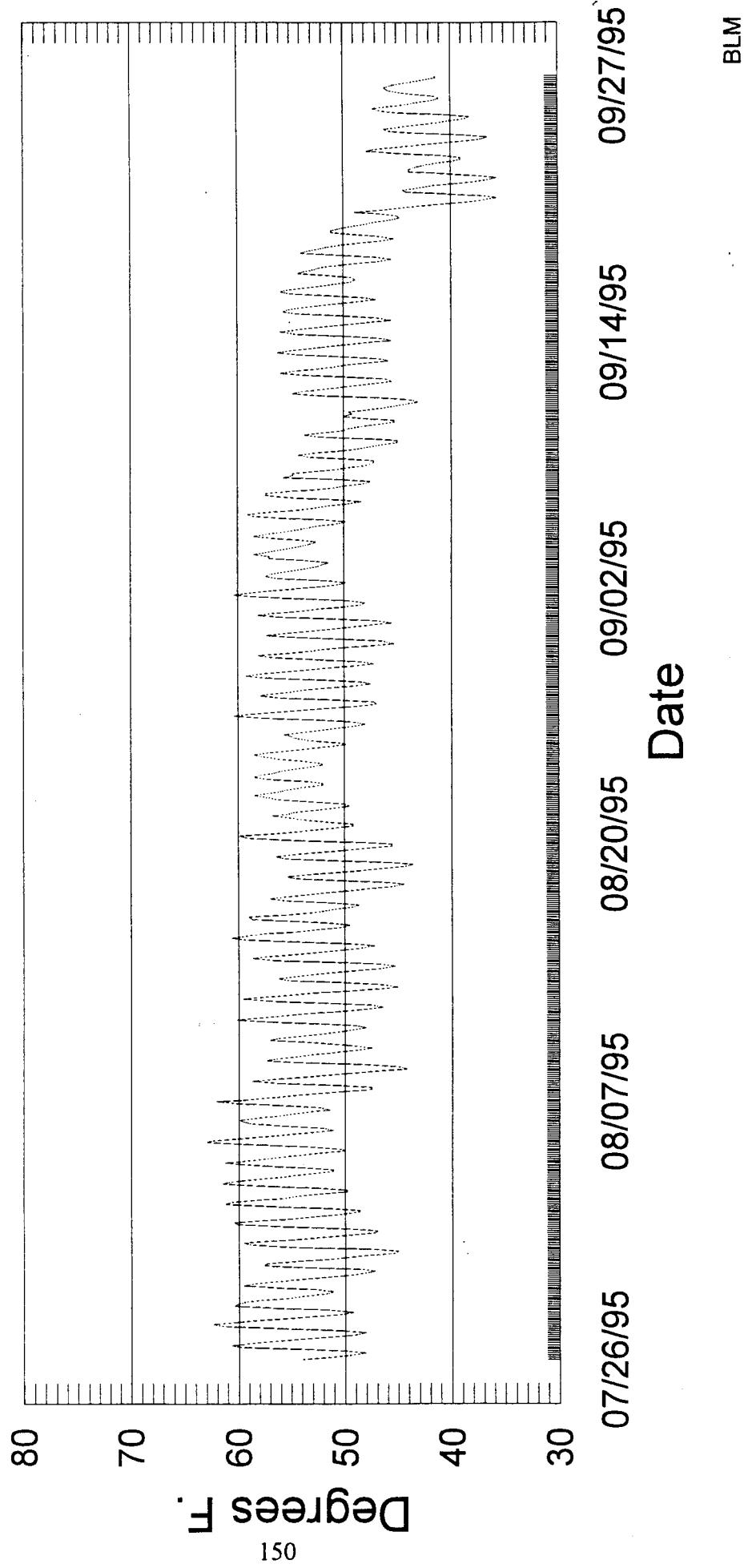
# Swan Basin Creek - Timber Creek Drainage

## 1995 HOBO Temperatures



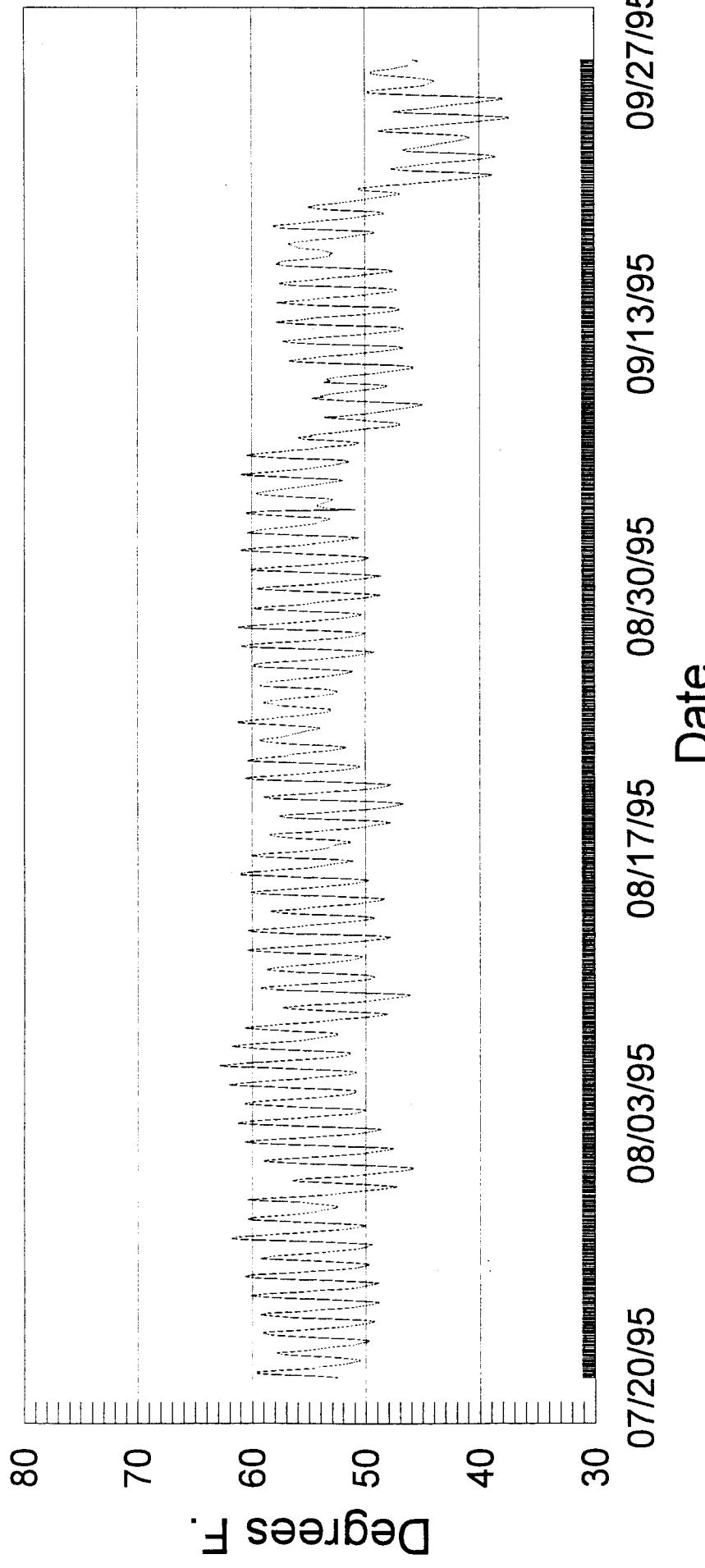
# Timber Creek One Mile above Highway 28

## 1995 HOBO Temperatures



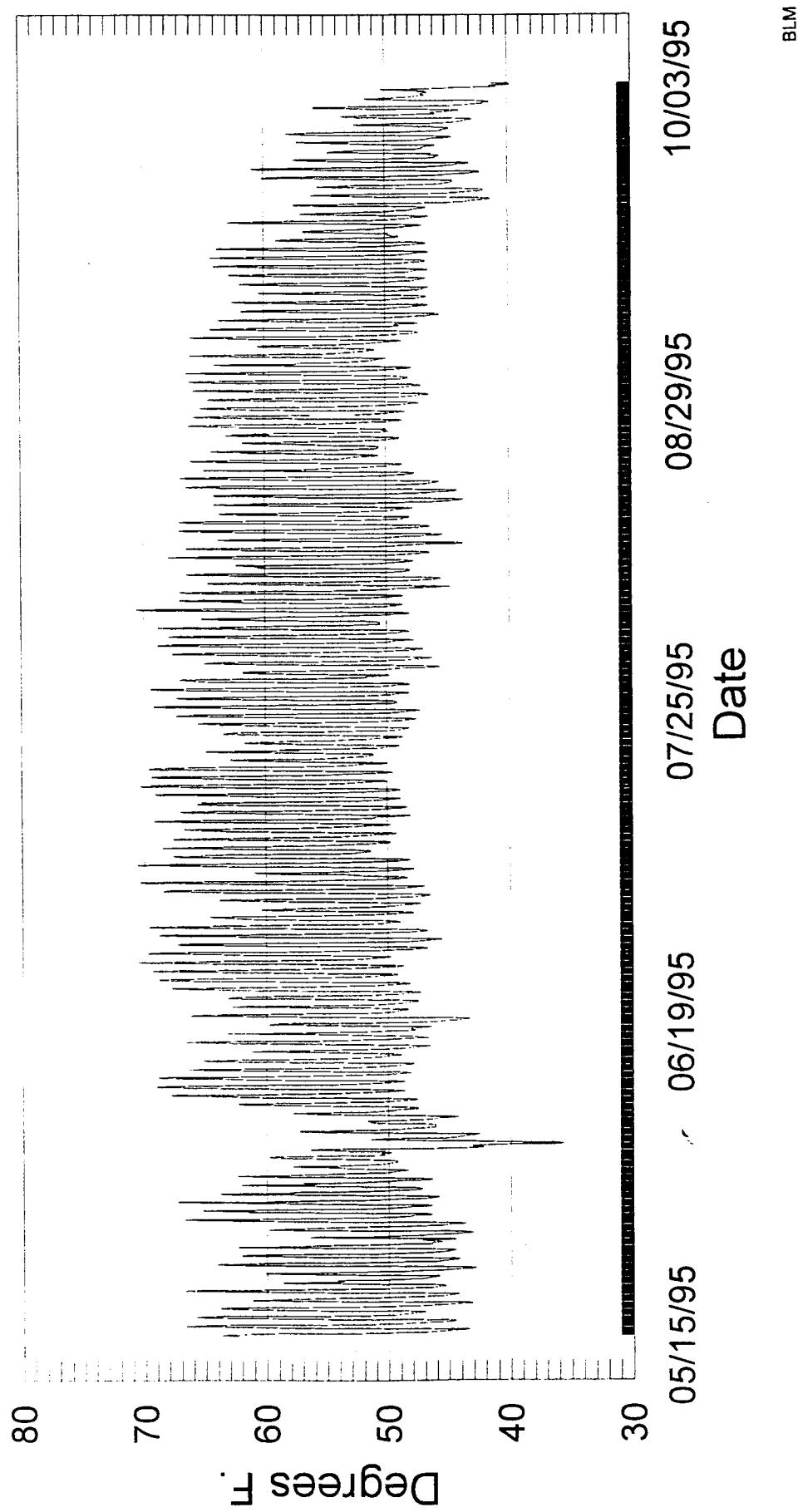
BLM

# Yearian Creek above Lower Road Crossing 1995 HOBO Temperatures

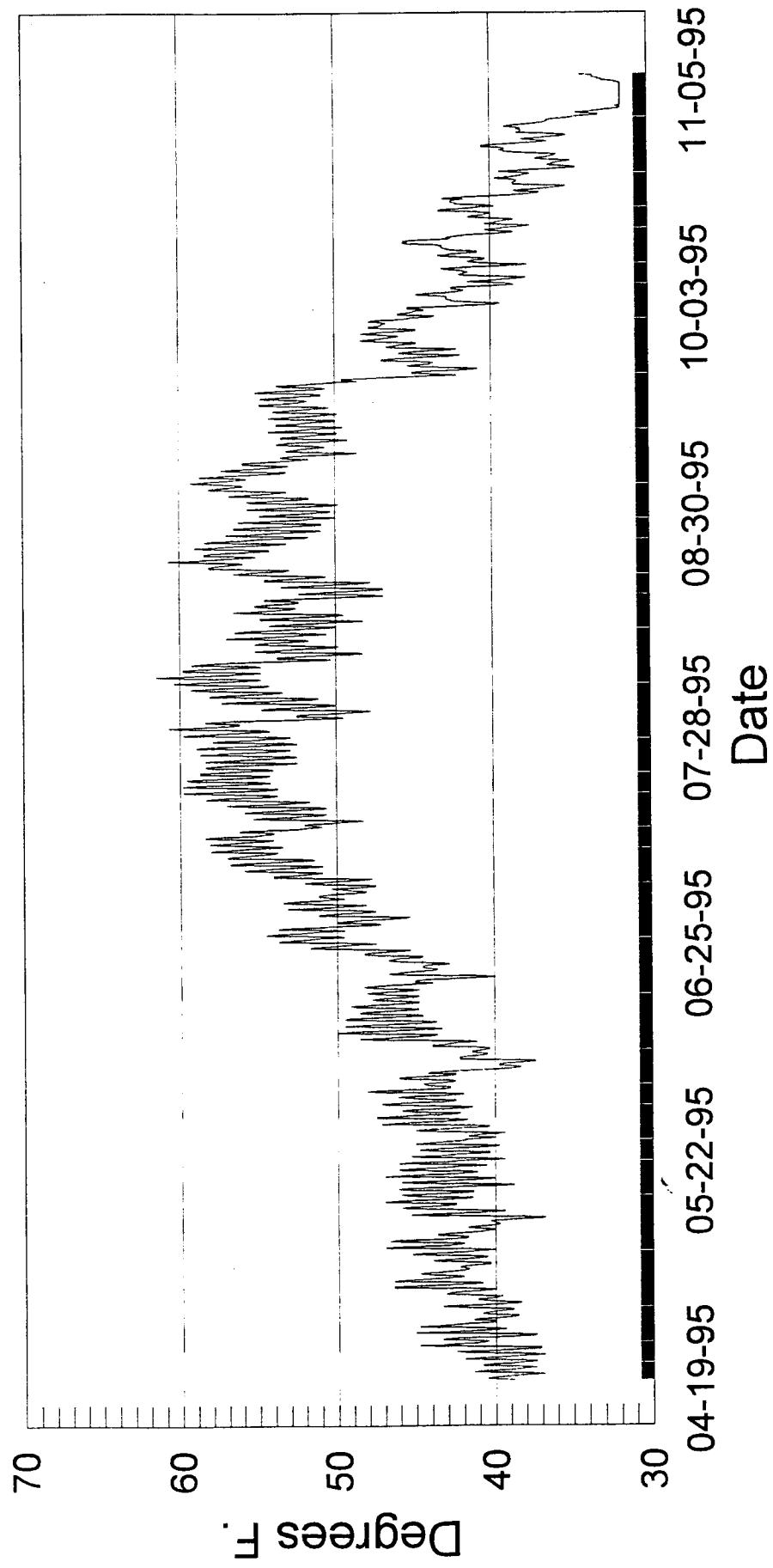


BLM

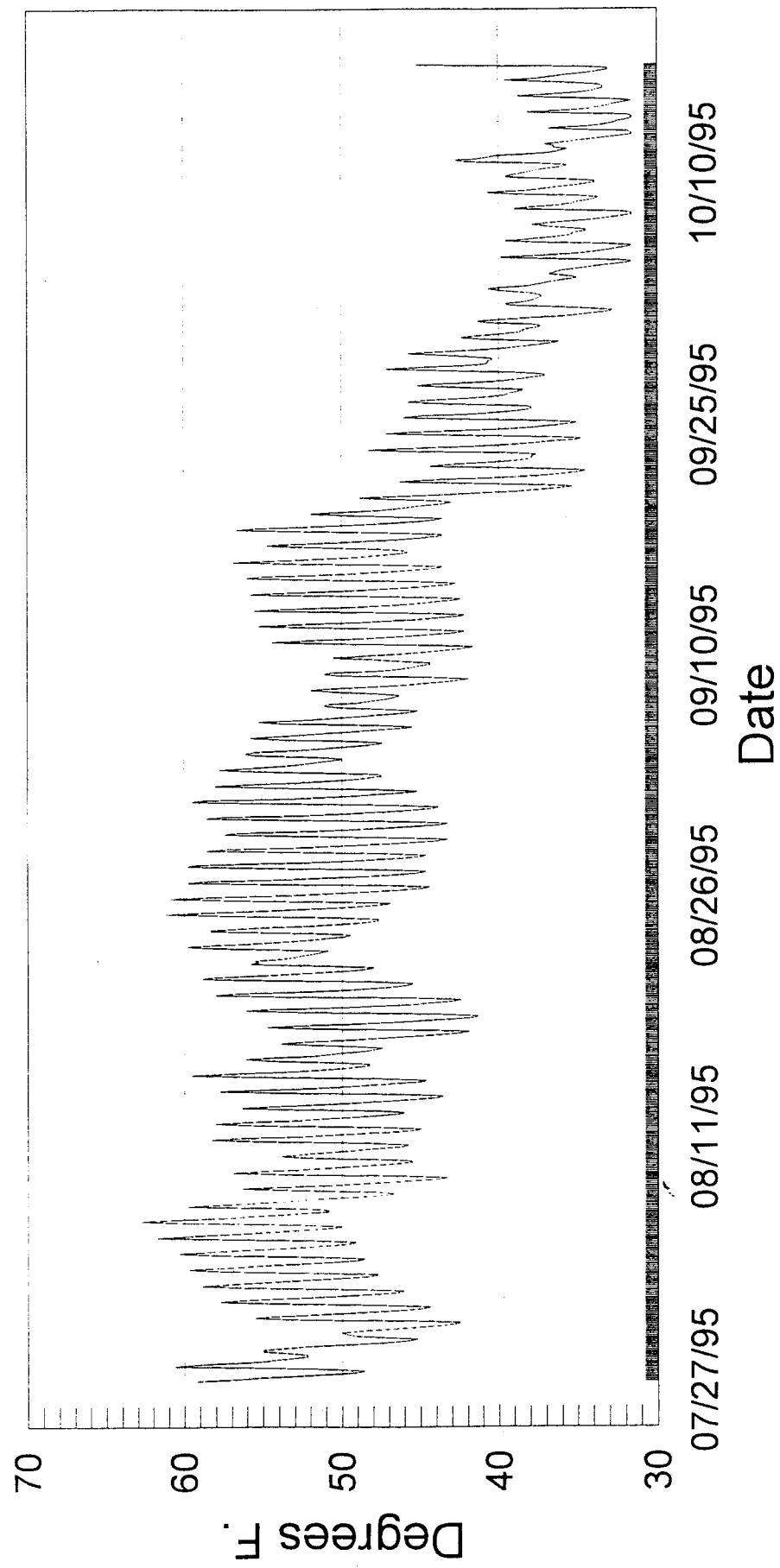
**Summit Creek  
1995 HOBO Temperatures**



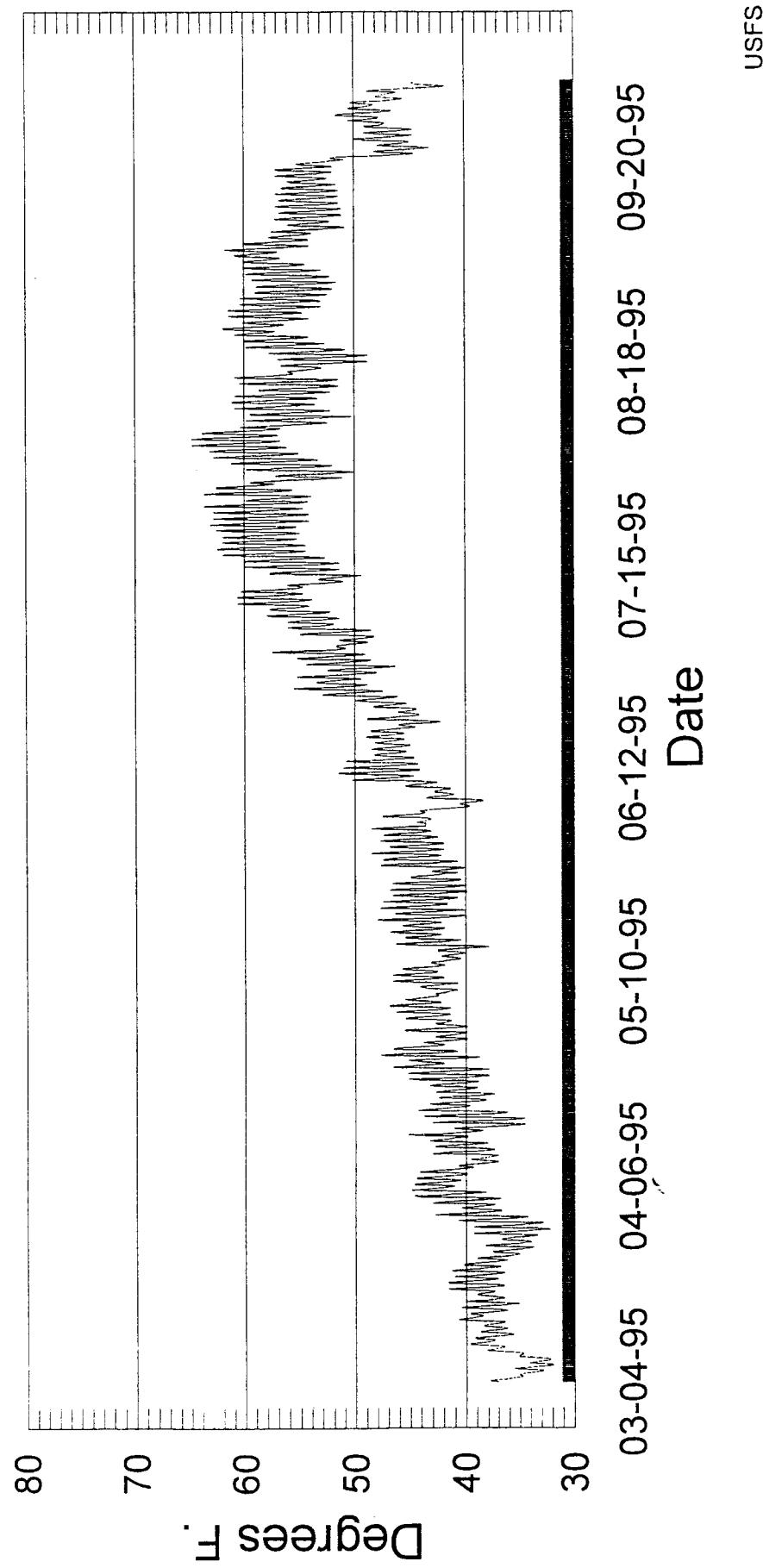
Boulder Creek  
1995 HOBO Temperatures



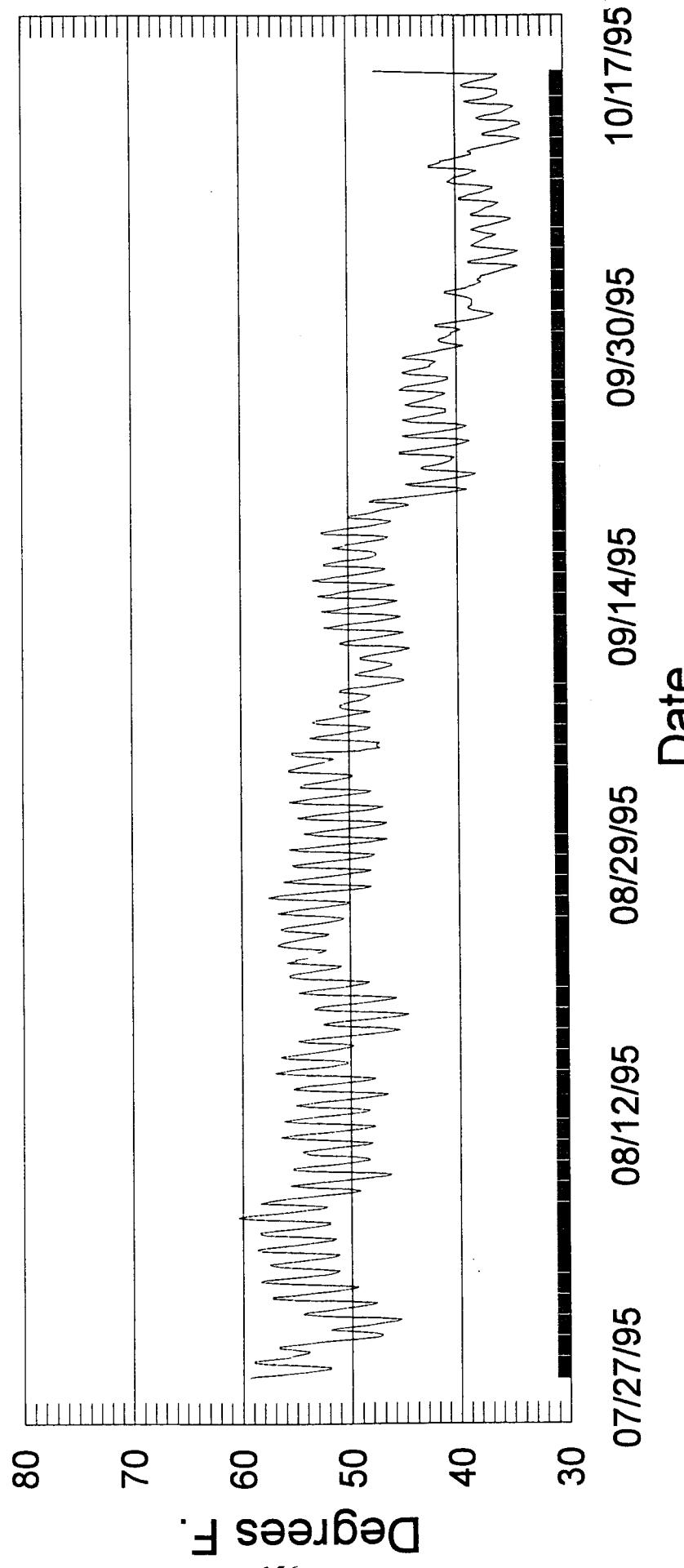
**East Boulder Creek above Bridge  
1995 HOBO Temperatures**



**Lower Horse Creek  
1995 HOBO Temperatures**

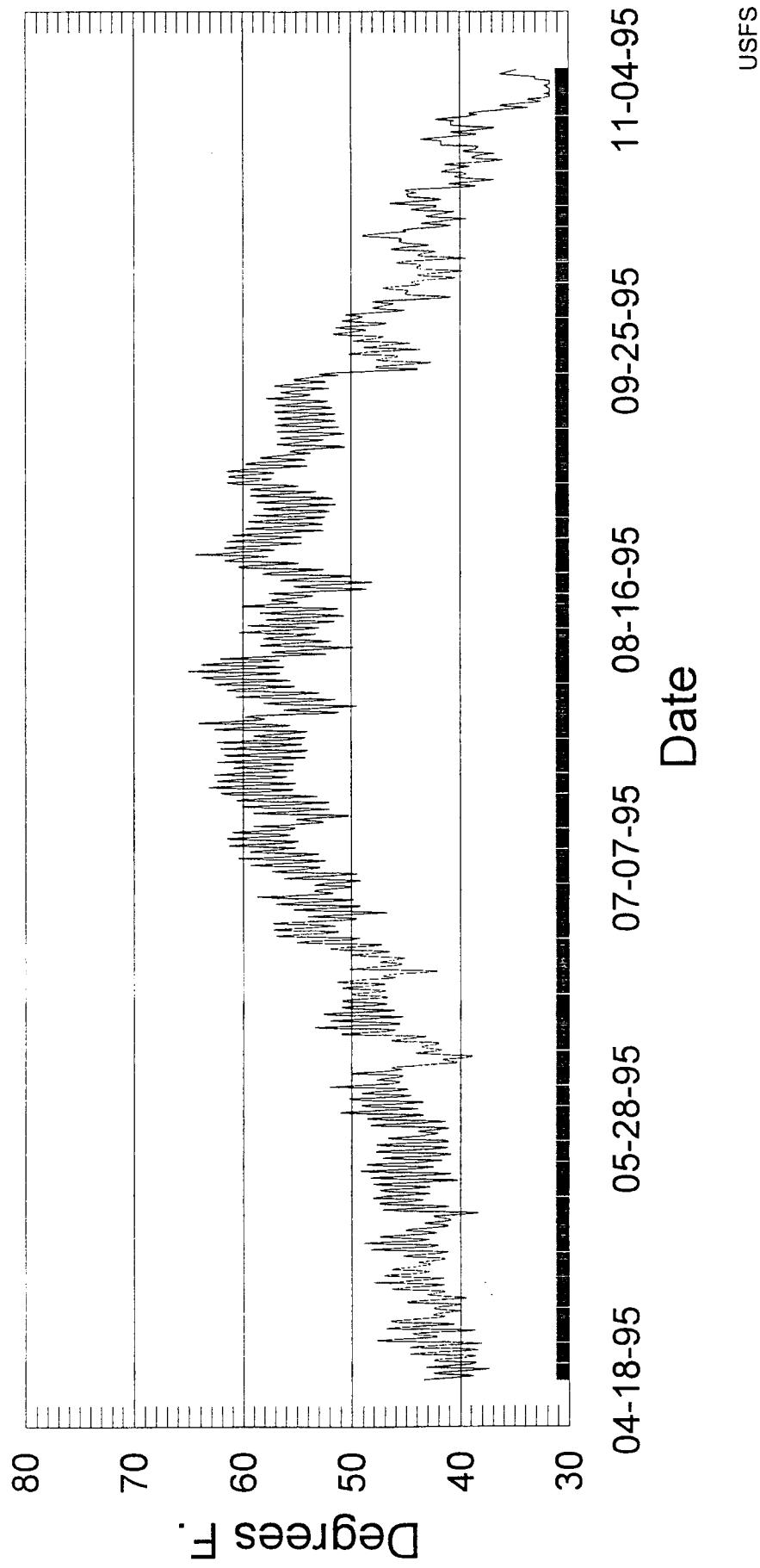


**Moose Creek above bridge - USFS**  
**1995 HOBO Temperatures**



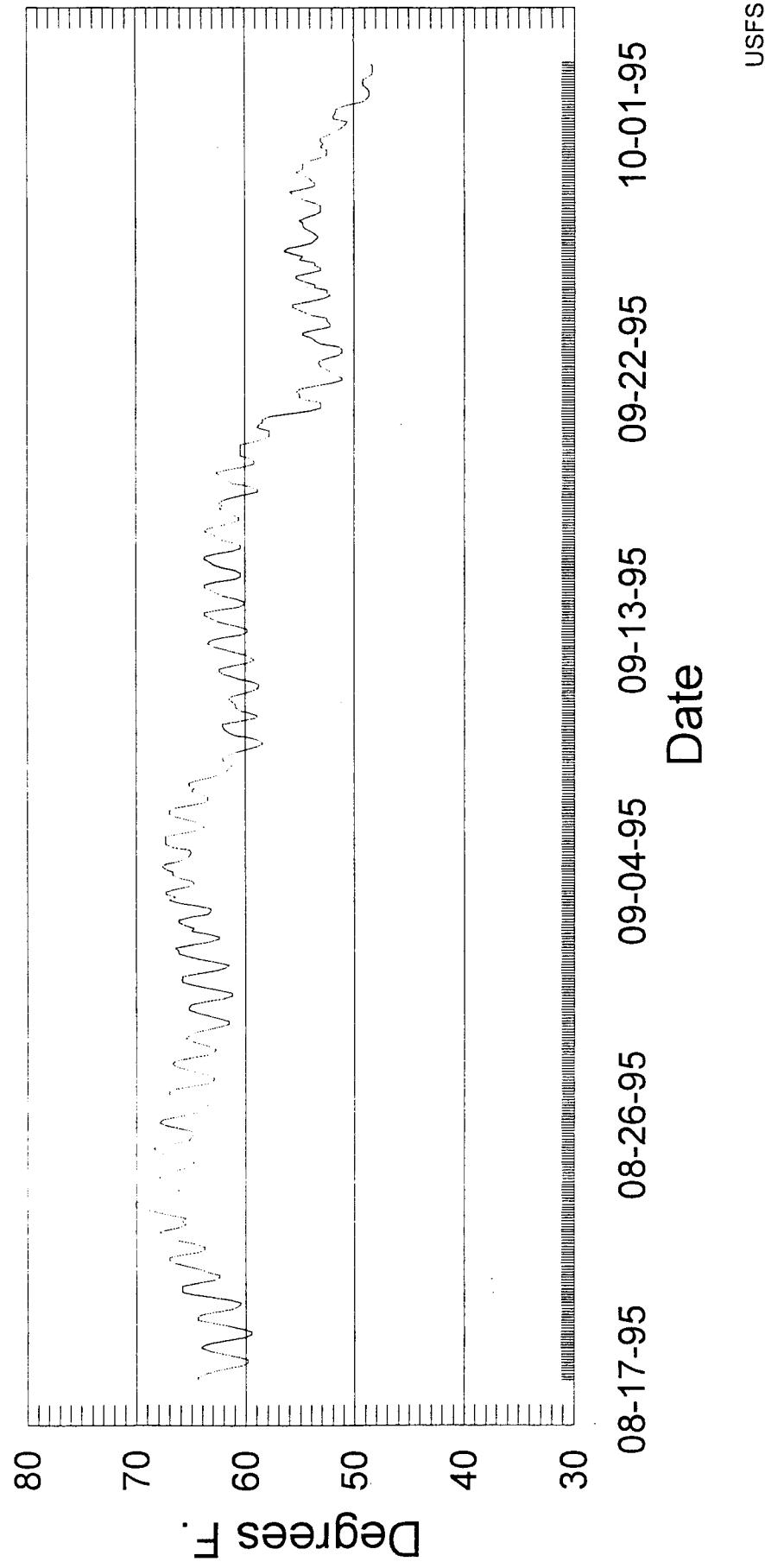
USFS

Owl Creek  
1995 HOBO Temperatures

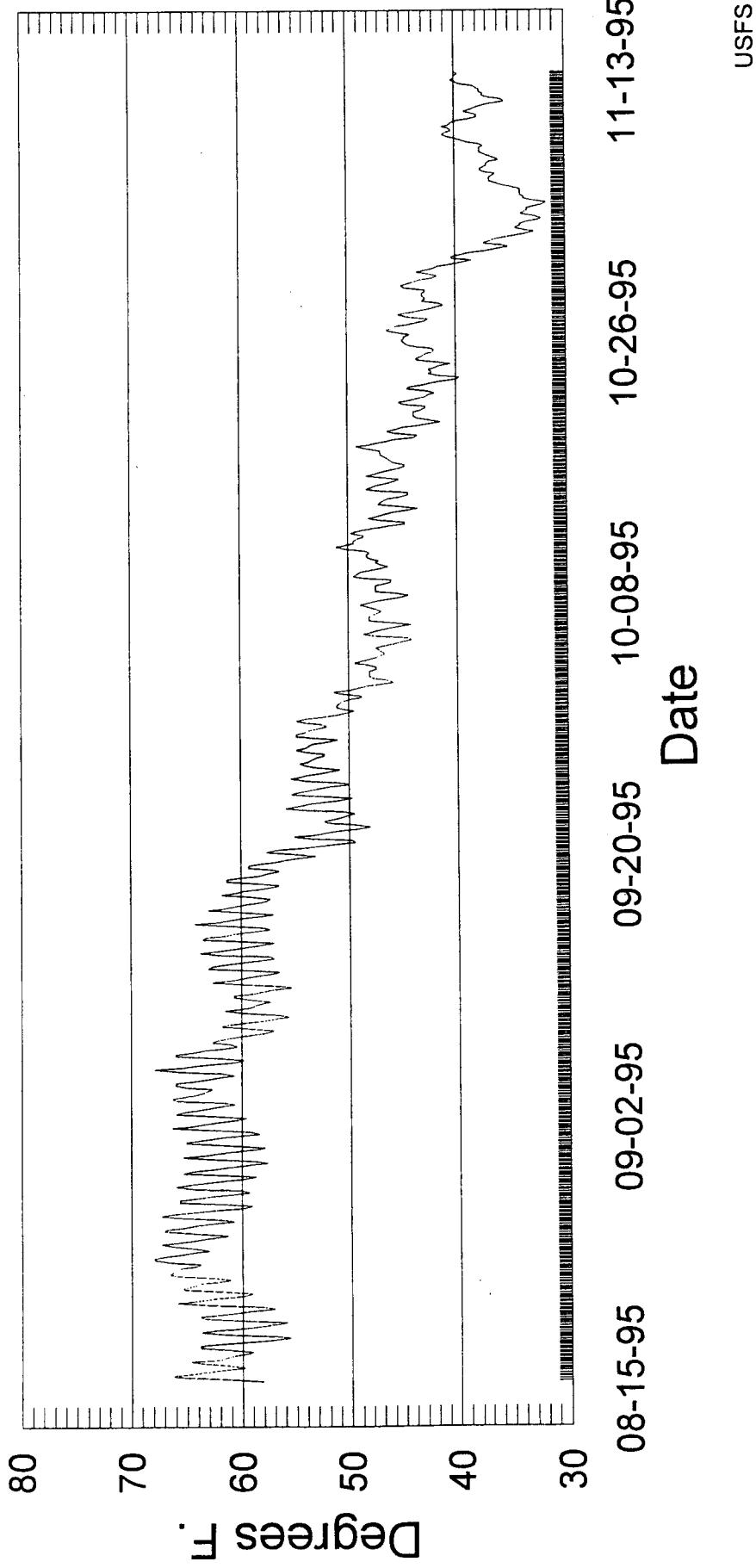


USFS

**Salmon River above Owl Creek  
1995 HOBO Temperatures**

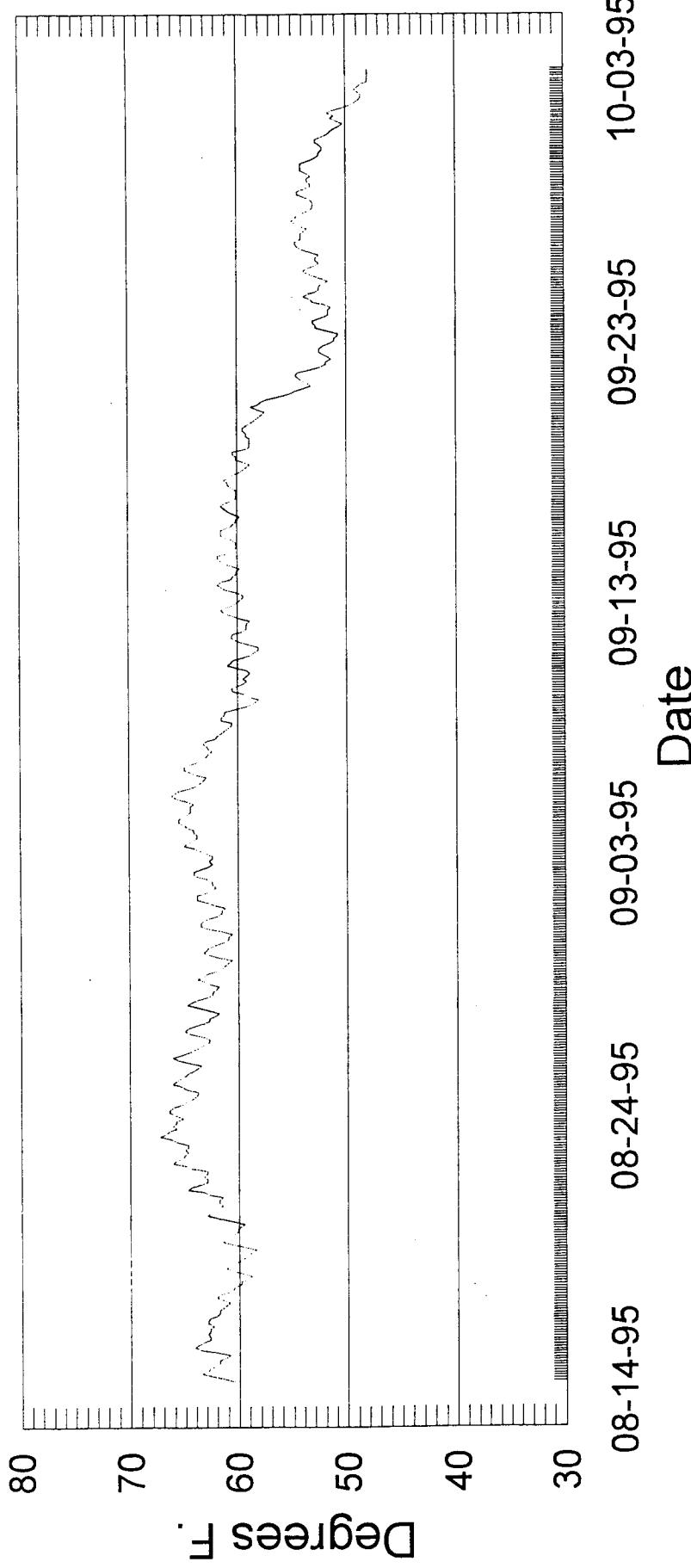


**Salmon River at Newland Creek Bridge  
1995 HOBO Temperatures**



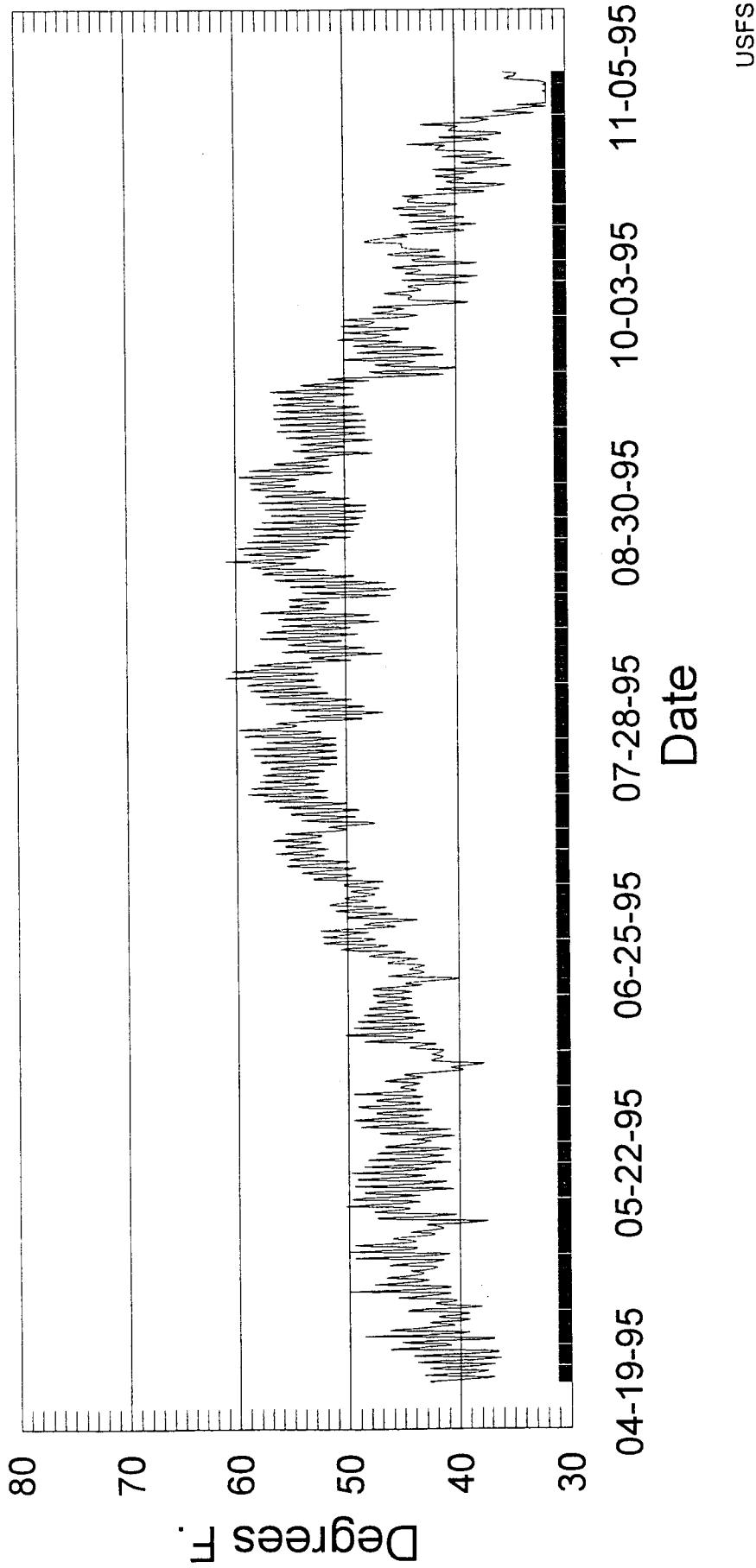
USFS

**Salmon River at Corn Creek  
1995 HOBO Temperatures**

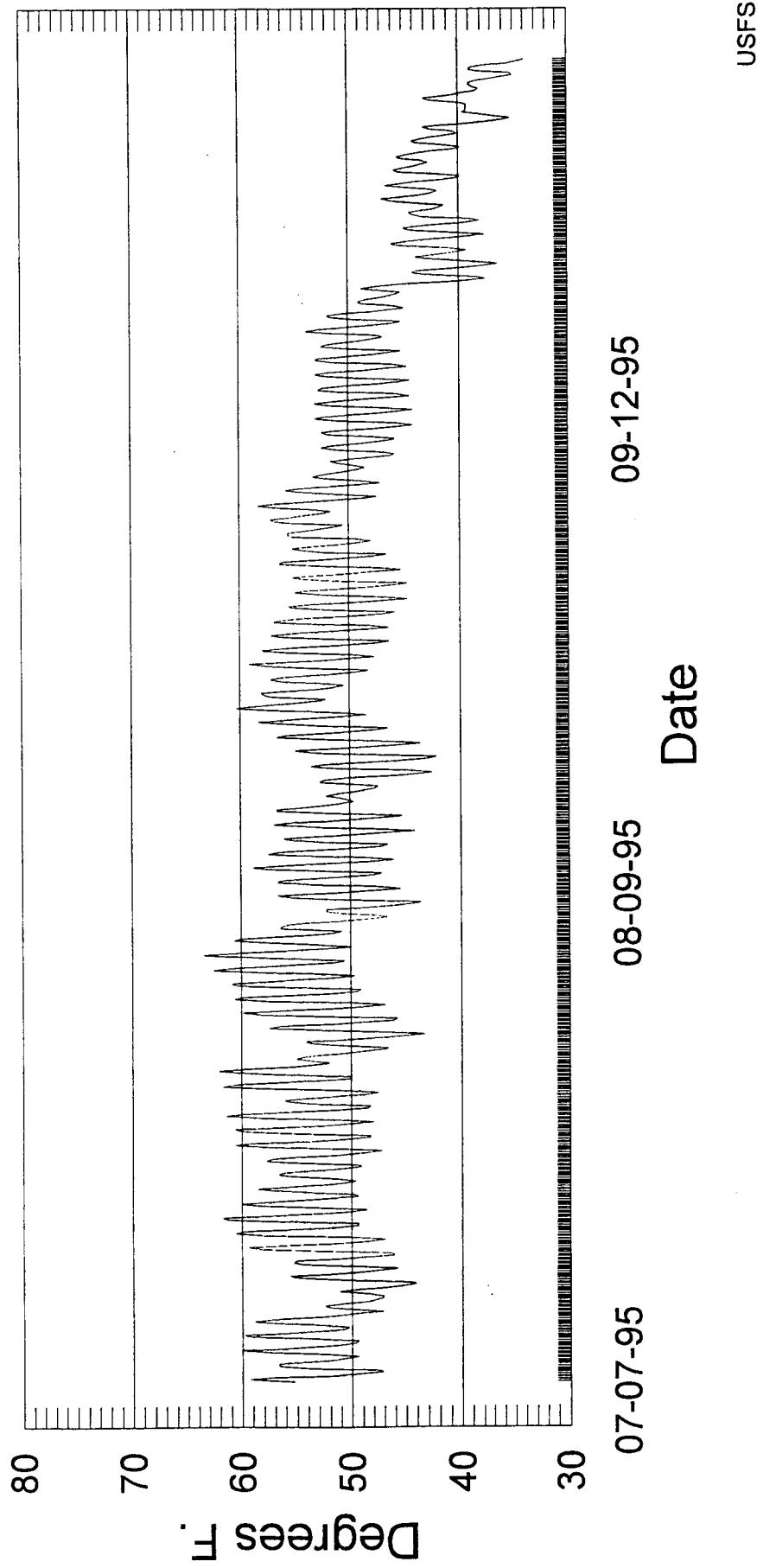


USFS

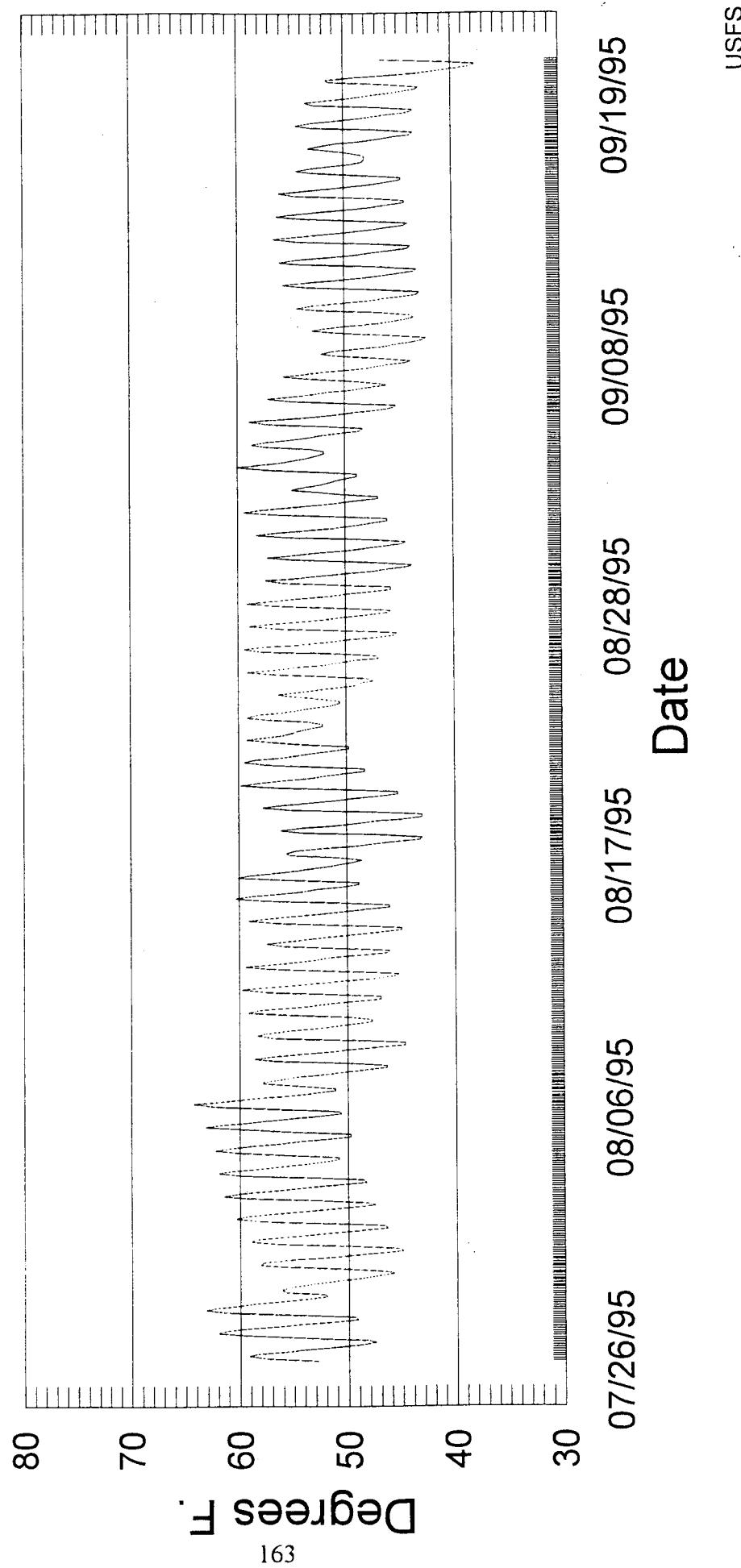
## Spring Creek 1995 HOBO Temperatures



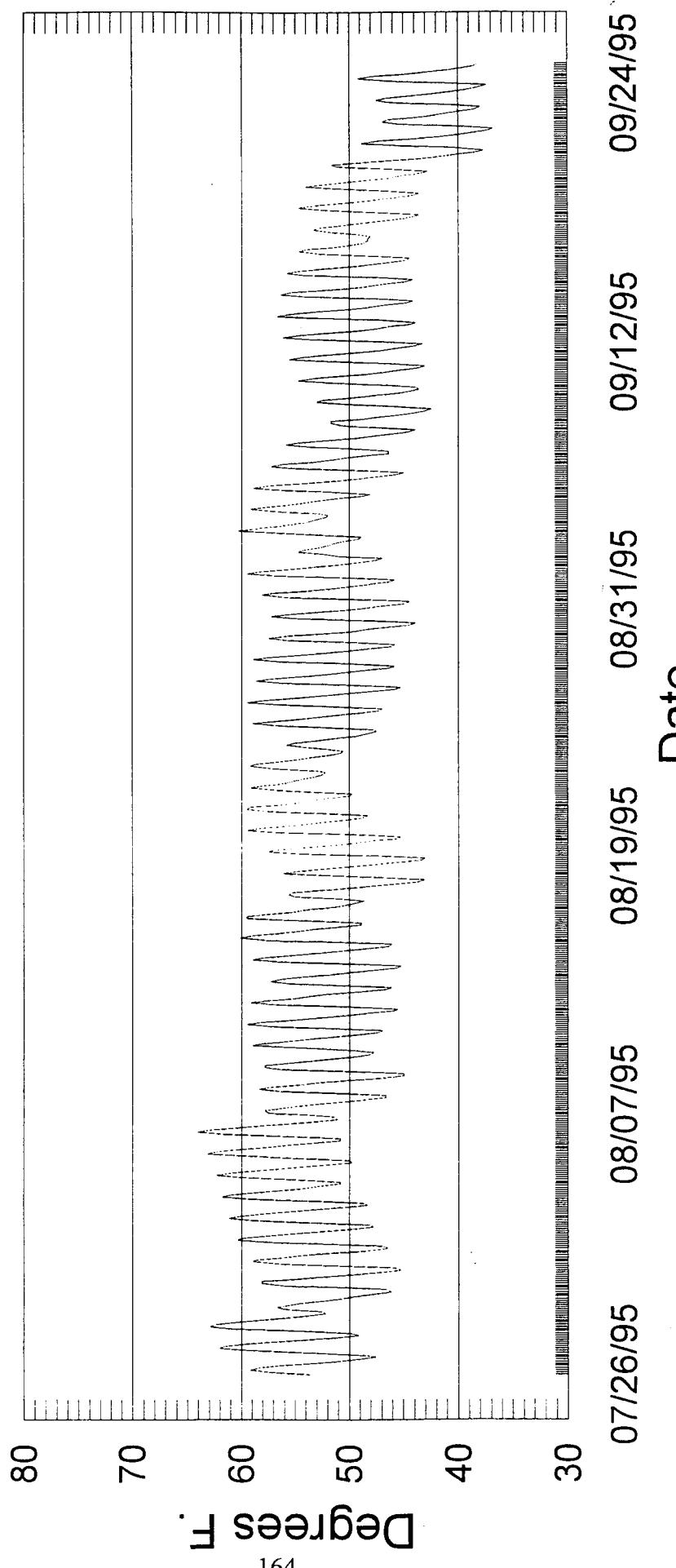
**Upper Horse Creek below Hot Springs**  
**1995 HOBO Temperatures**



## Knapp Creek above Lower Diversion 1995 HOBO Temperatures

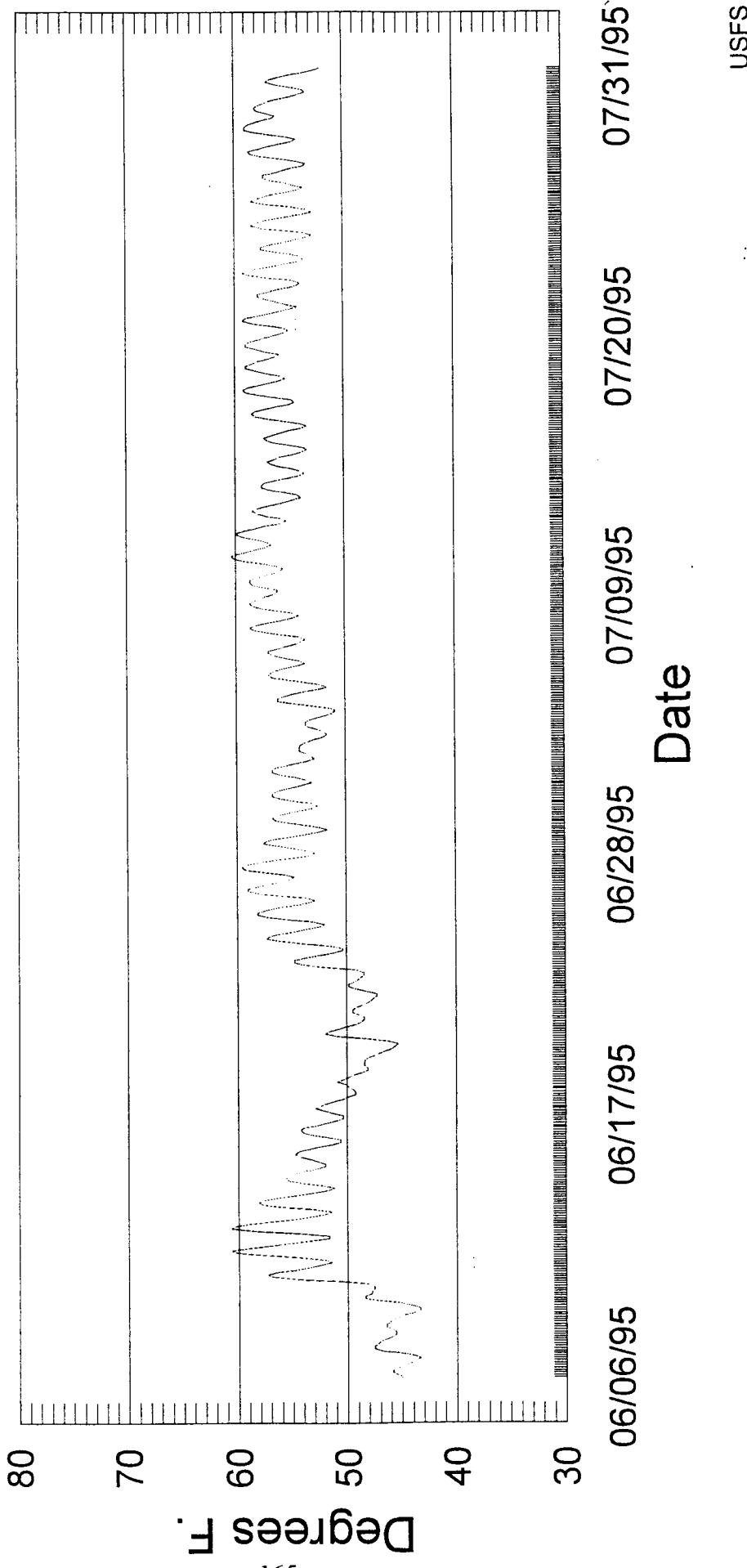


## Knapp Creek Above Top Diversions 1995 HOBO Temperatures



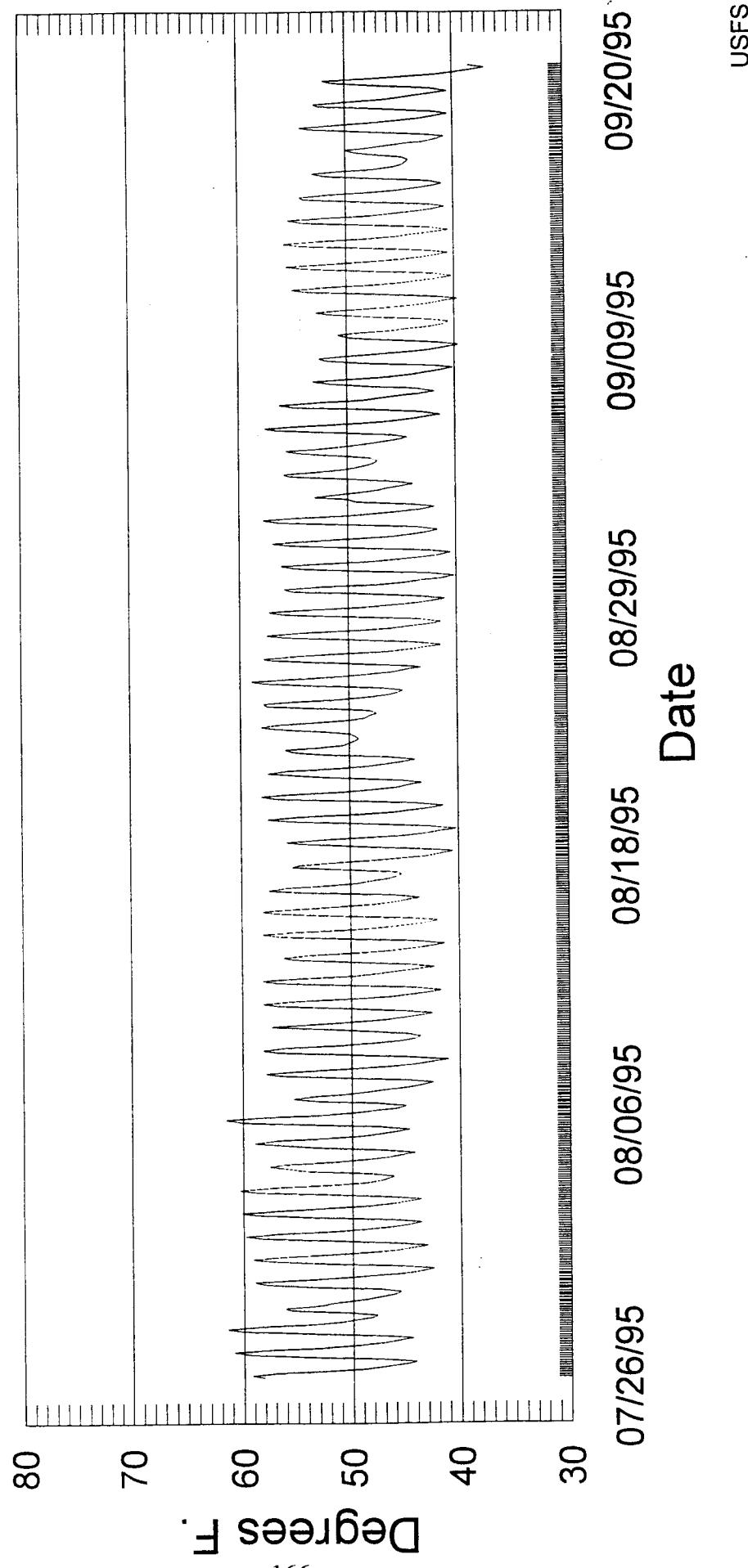
USFS

## Upper Marsh Creek 1995 HOBO Temperatures



# Marsh Creek above Knapp Creek

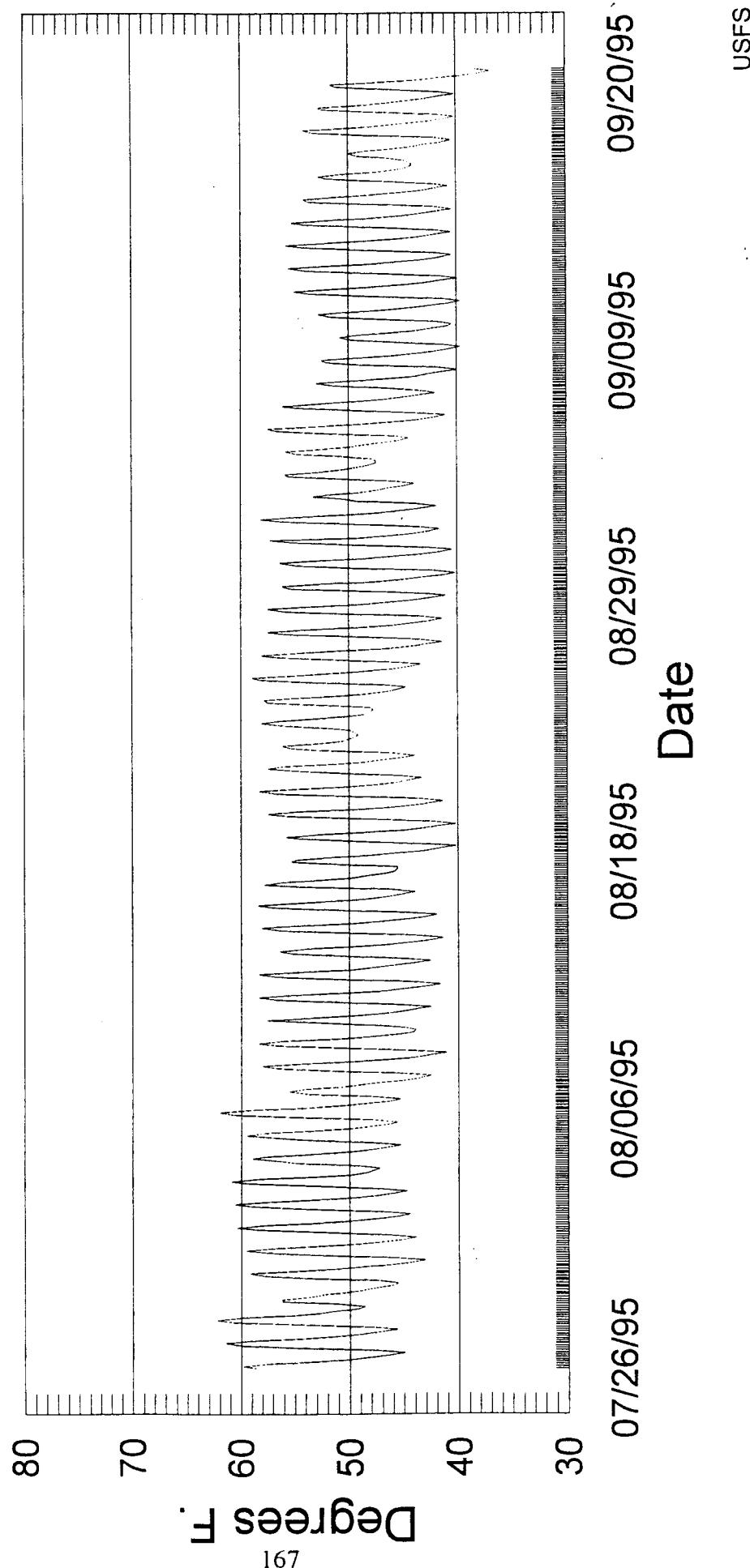
## 1995 HOBO Temperatures



USFS

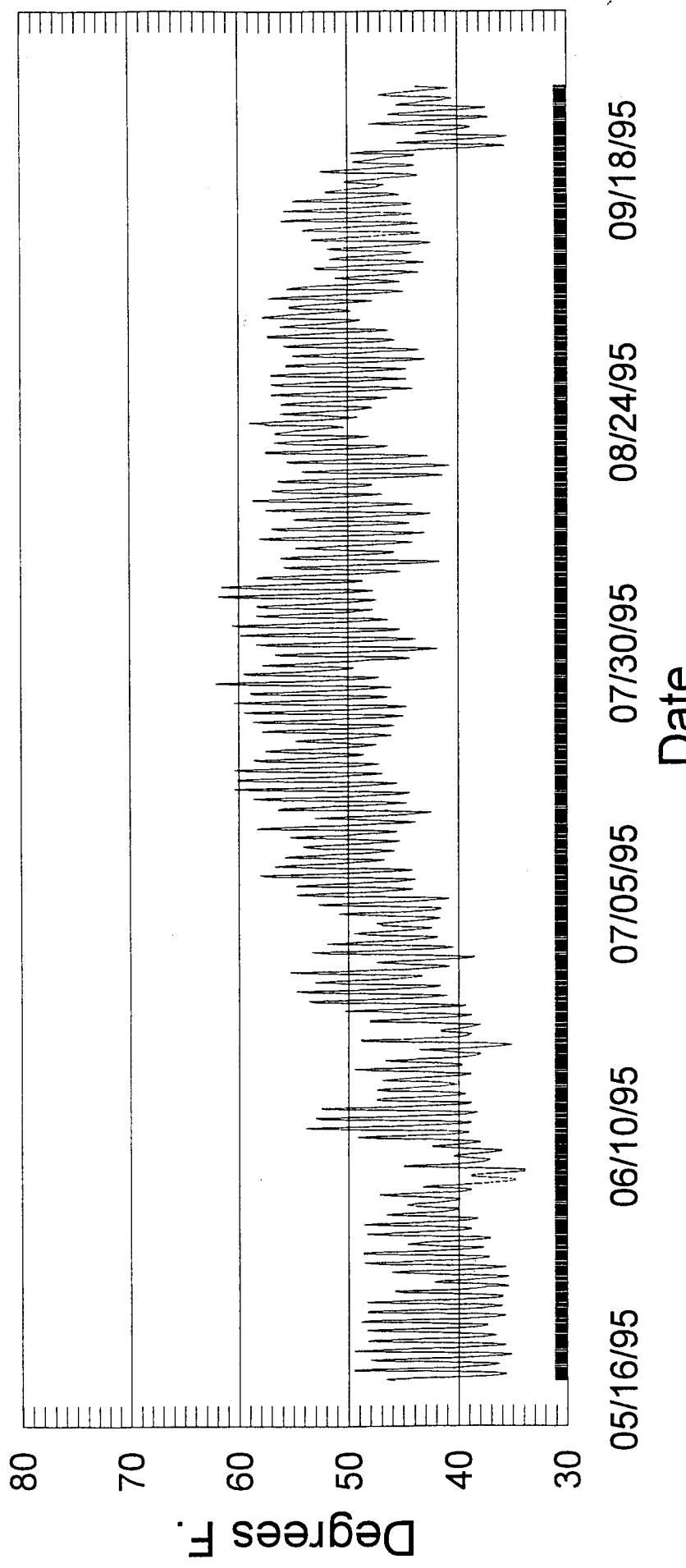
# Marsh Creek below Knapp Creek

## 1995 HOBO Temperatures



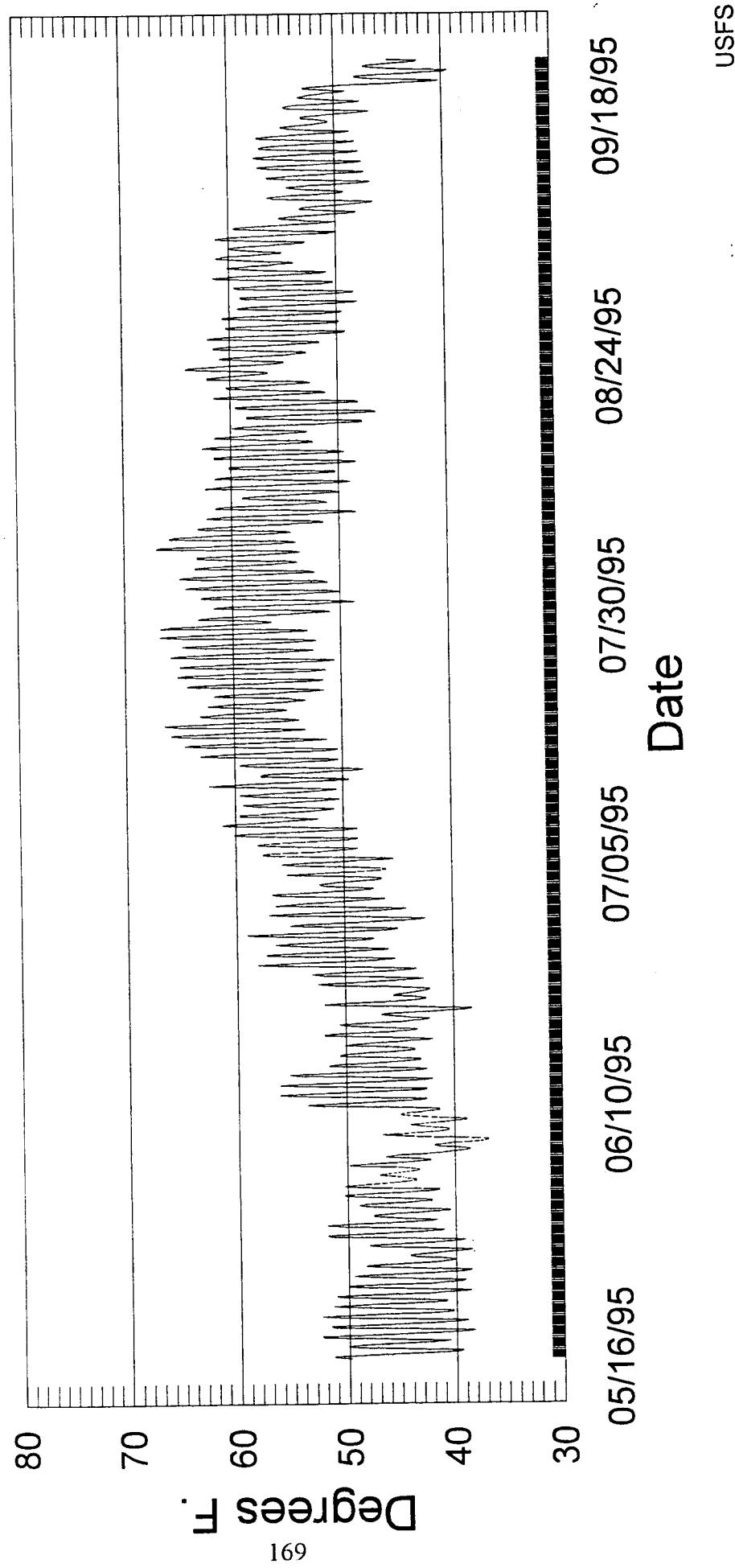
USFS

**Corral Creek**  
**1995 HOBO Temperatures**



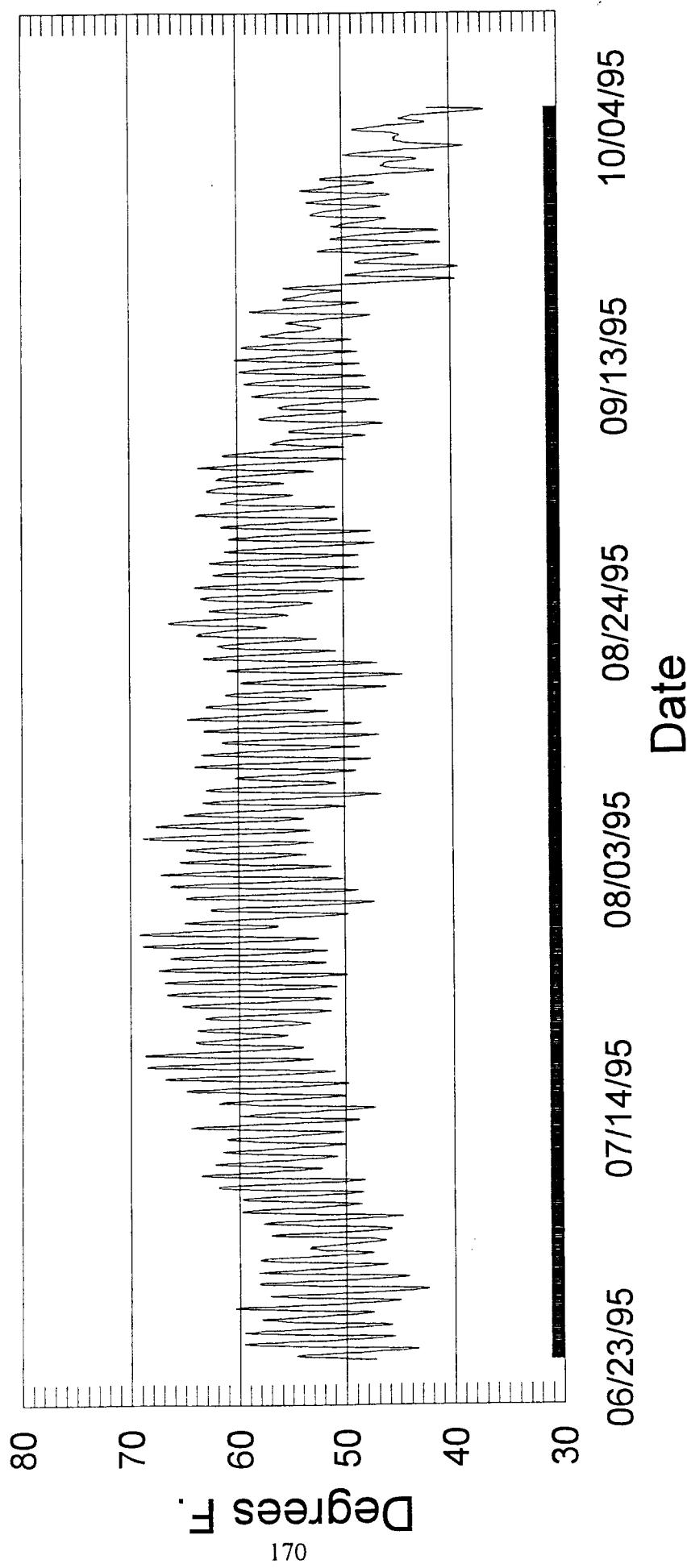
USFS

# Morgan Creek 1995 HOBO Temperatures



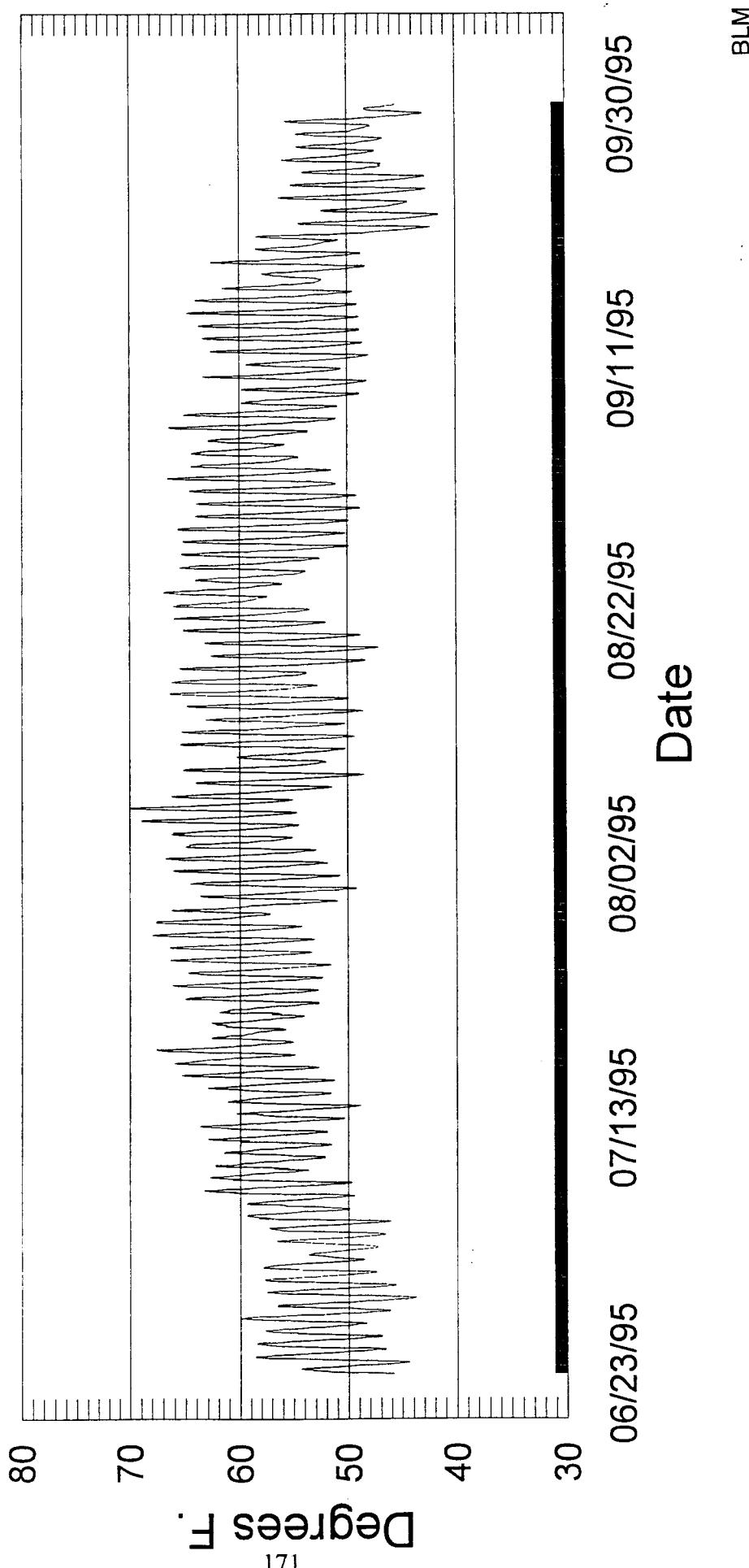
# Morgan Creek above West Fork Morgan Creek

## 1995 HOBO Temperatures

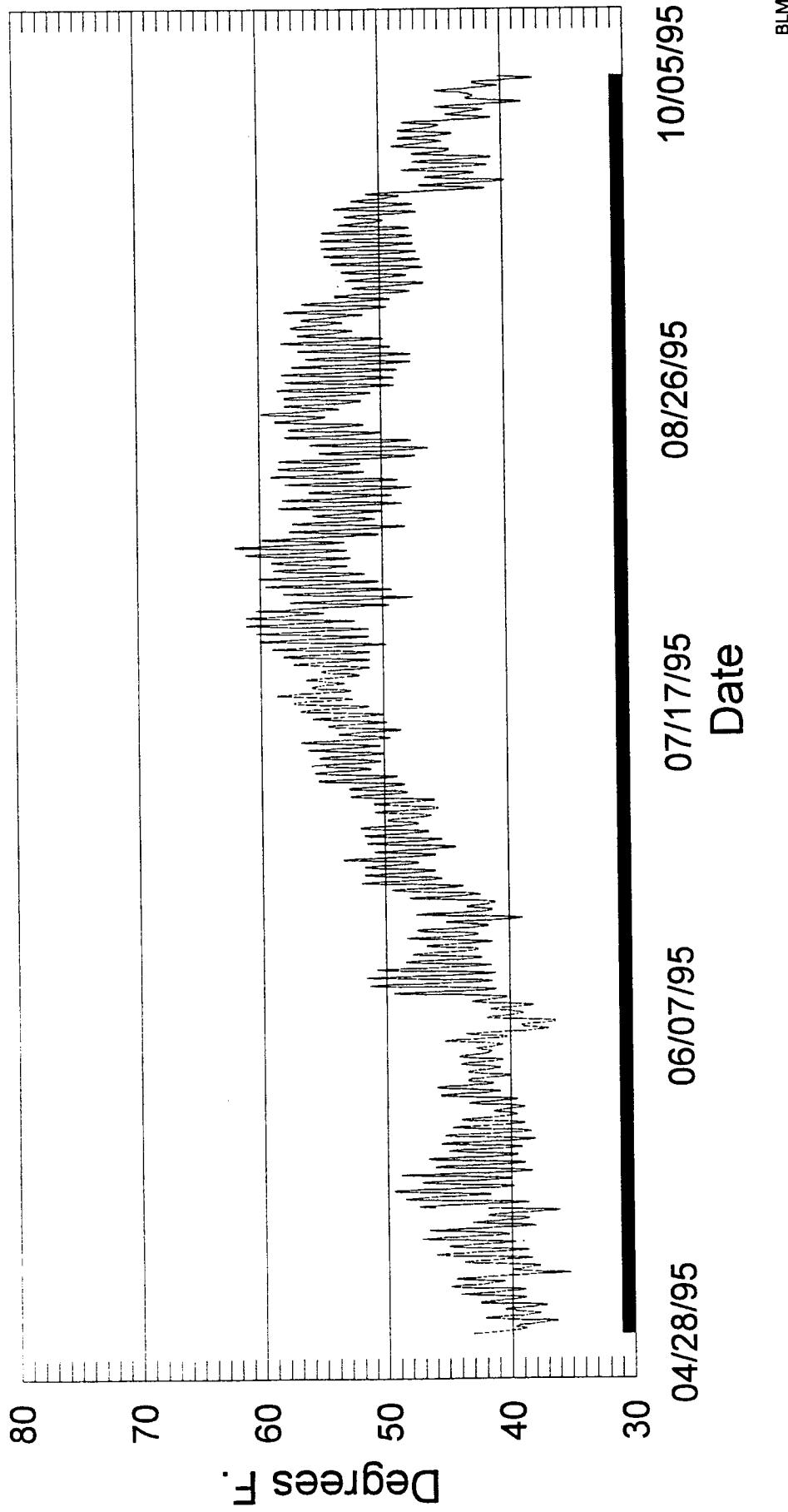


BLM

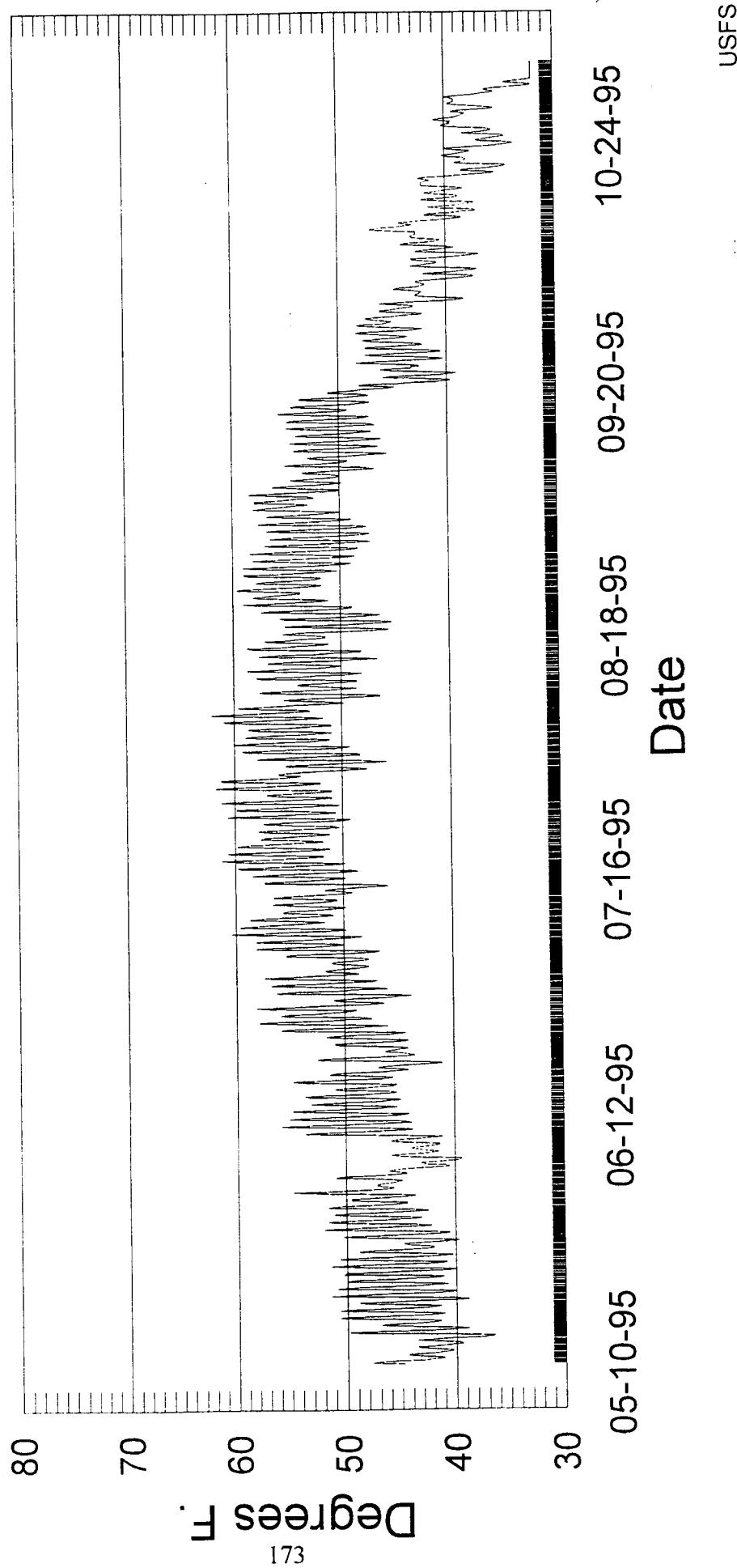
## Morgan Creek below BLM Campsite 1995 HOBO Temperatures



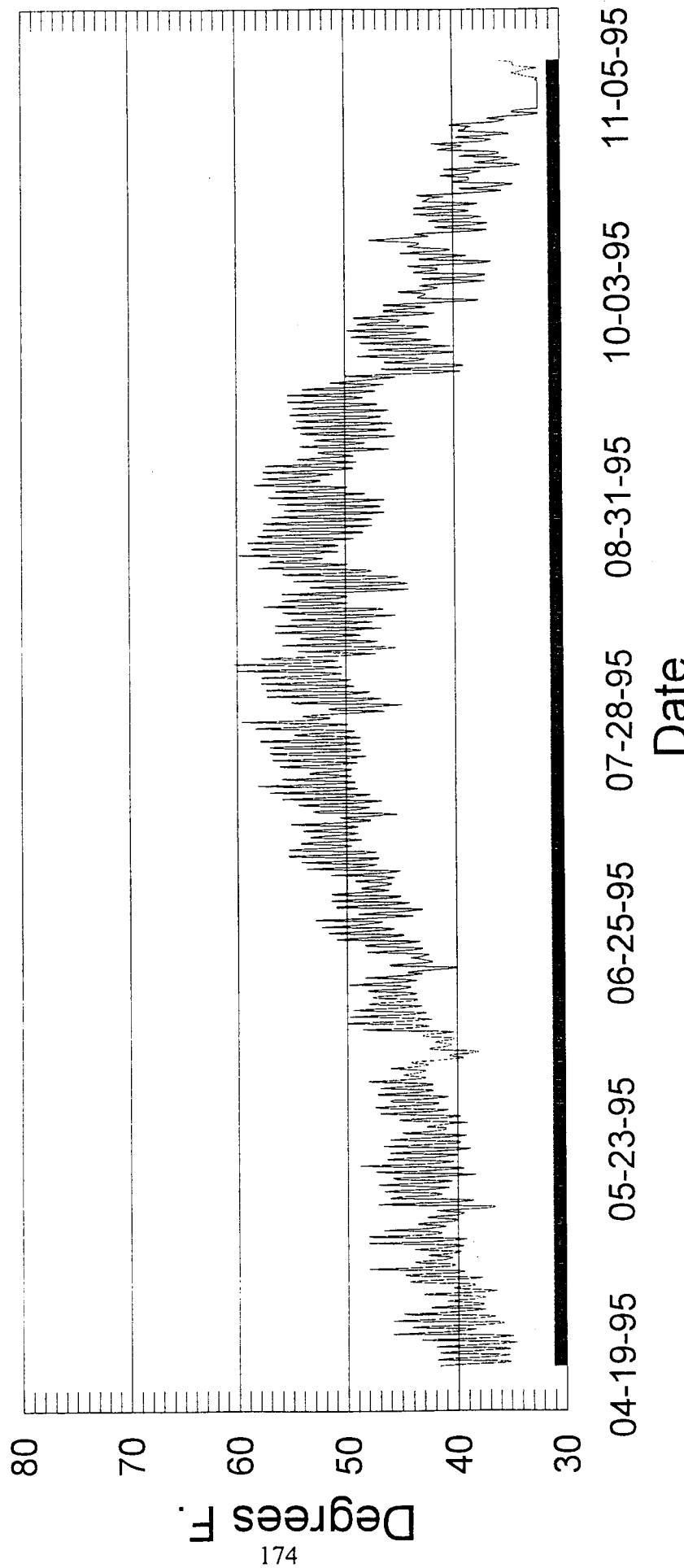
**West Fork Morgan Creek  
1995 HOBO Temperatures**



## Dahlonega Creek 1995 HOBO Temperatures

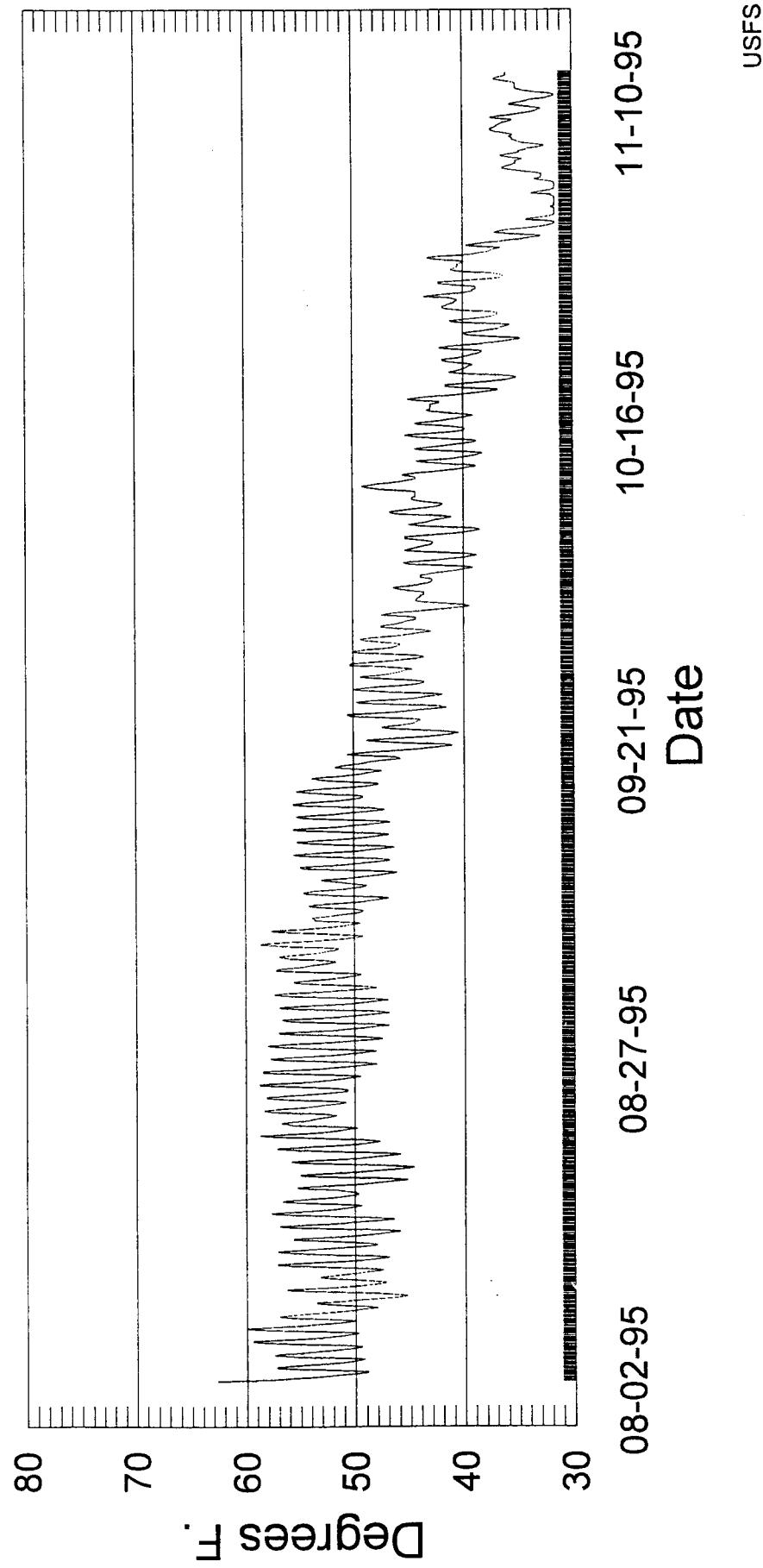


## Hughes Creek 1995 HOBO Temperatures

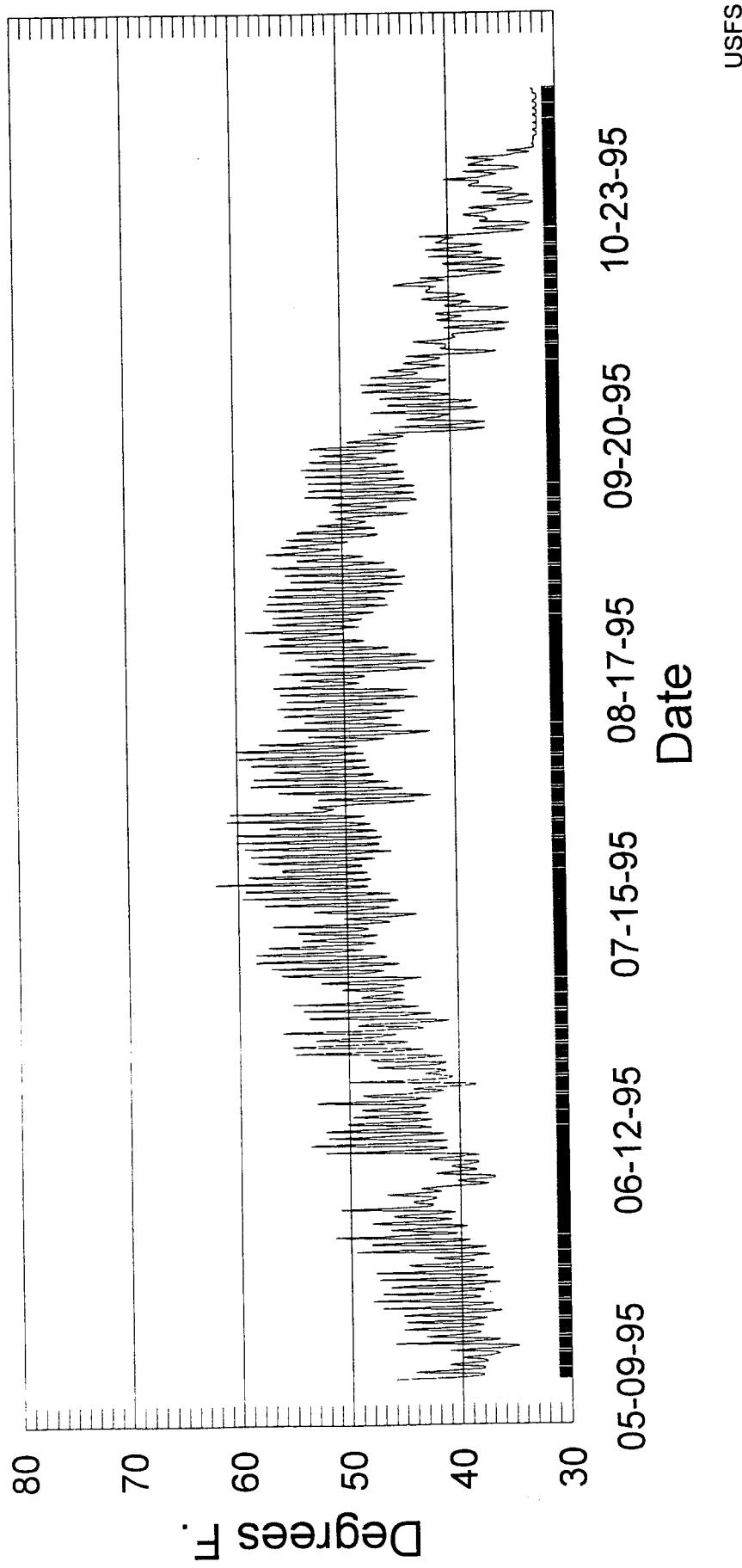


USFS

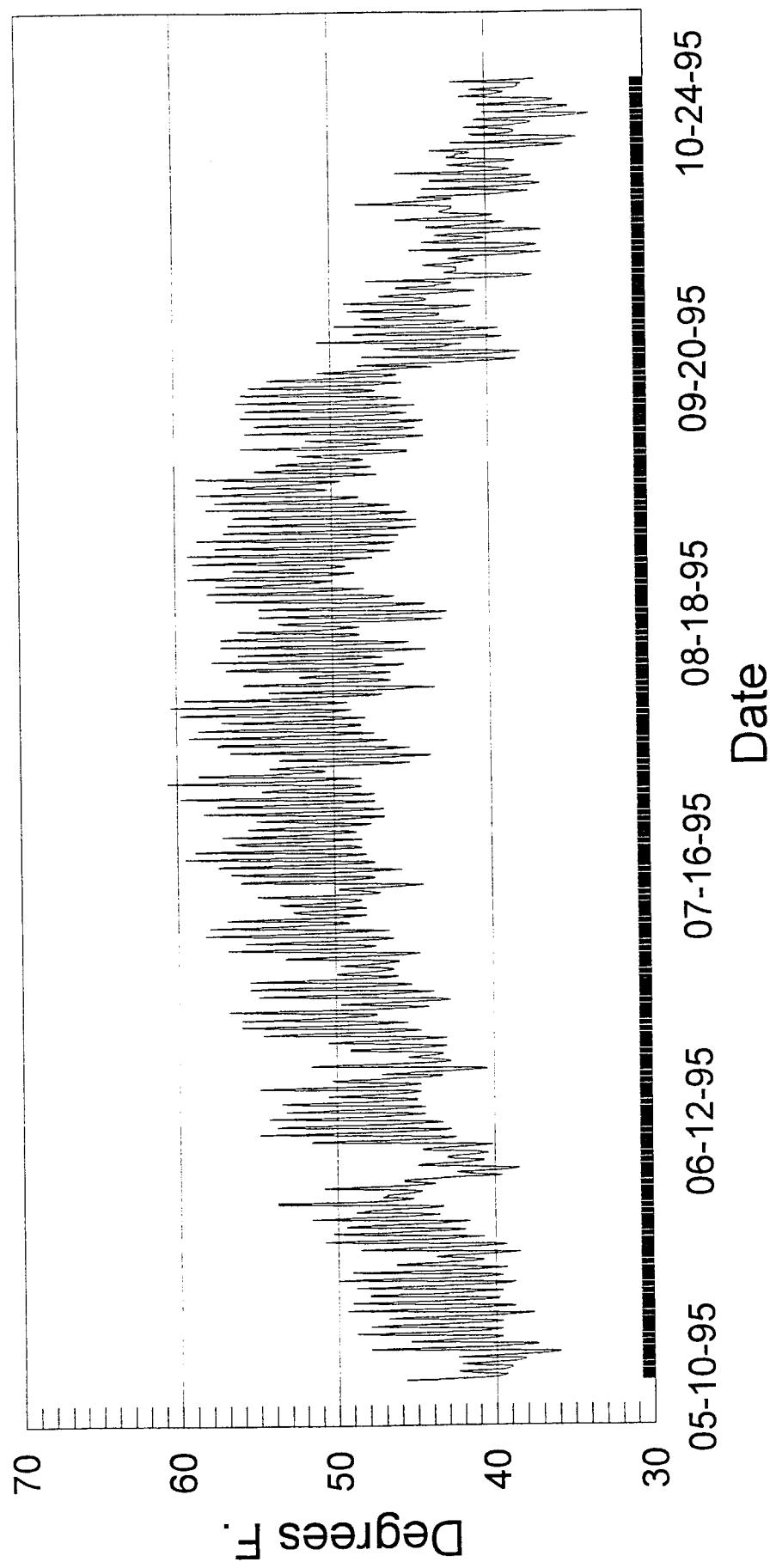
**North Fork Salmon River at Hughes Creek  
1995 HOBO Temperatures**



Pierce Creek  
1995 HOBO Temperatures

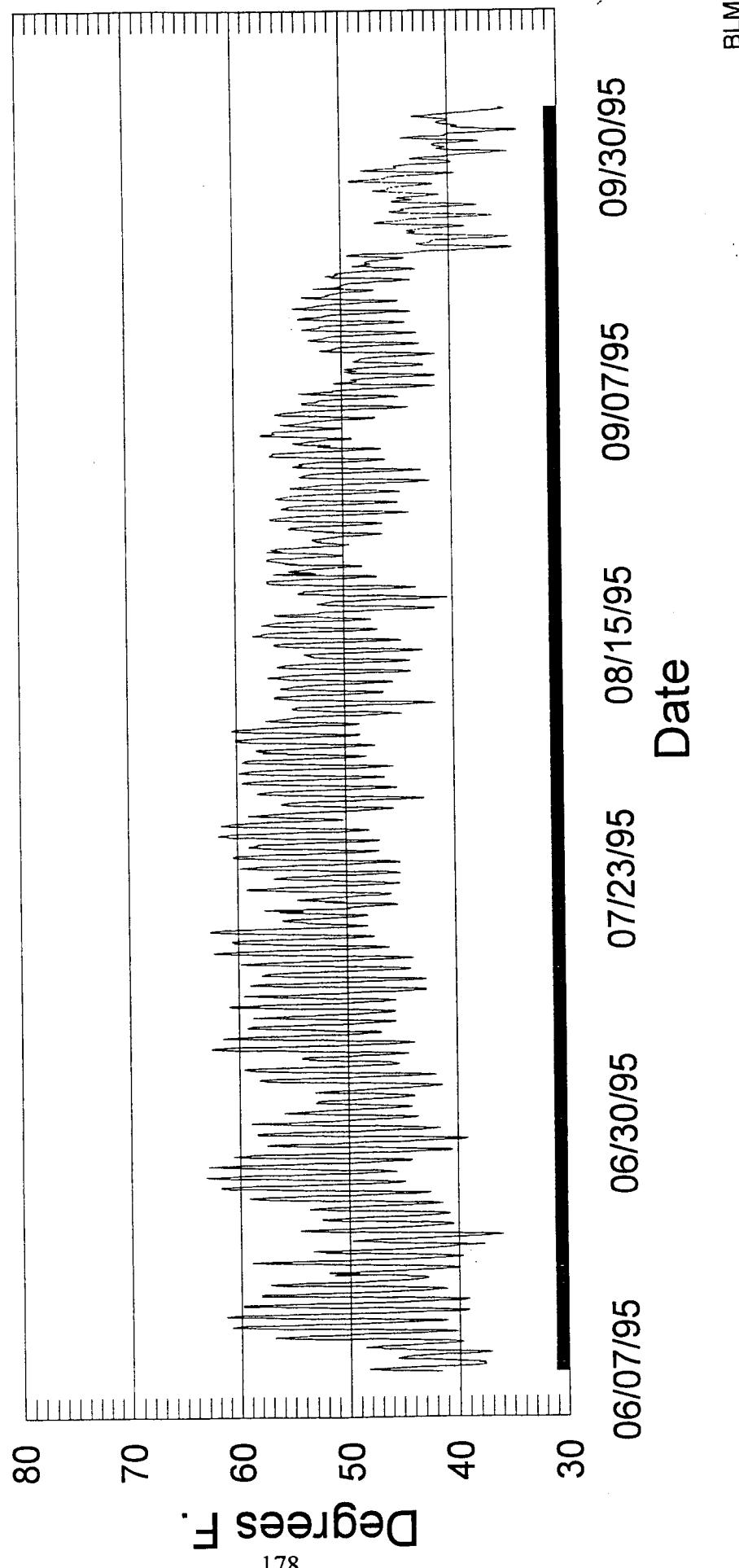


**Threemile Creek**  
**1995 HOBO Temperatures**



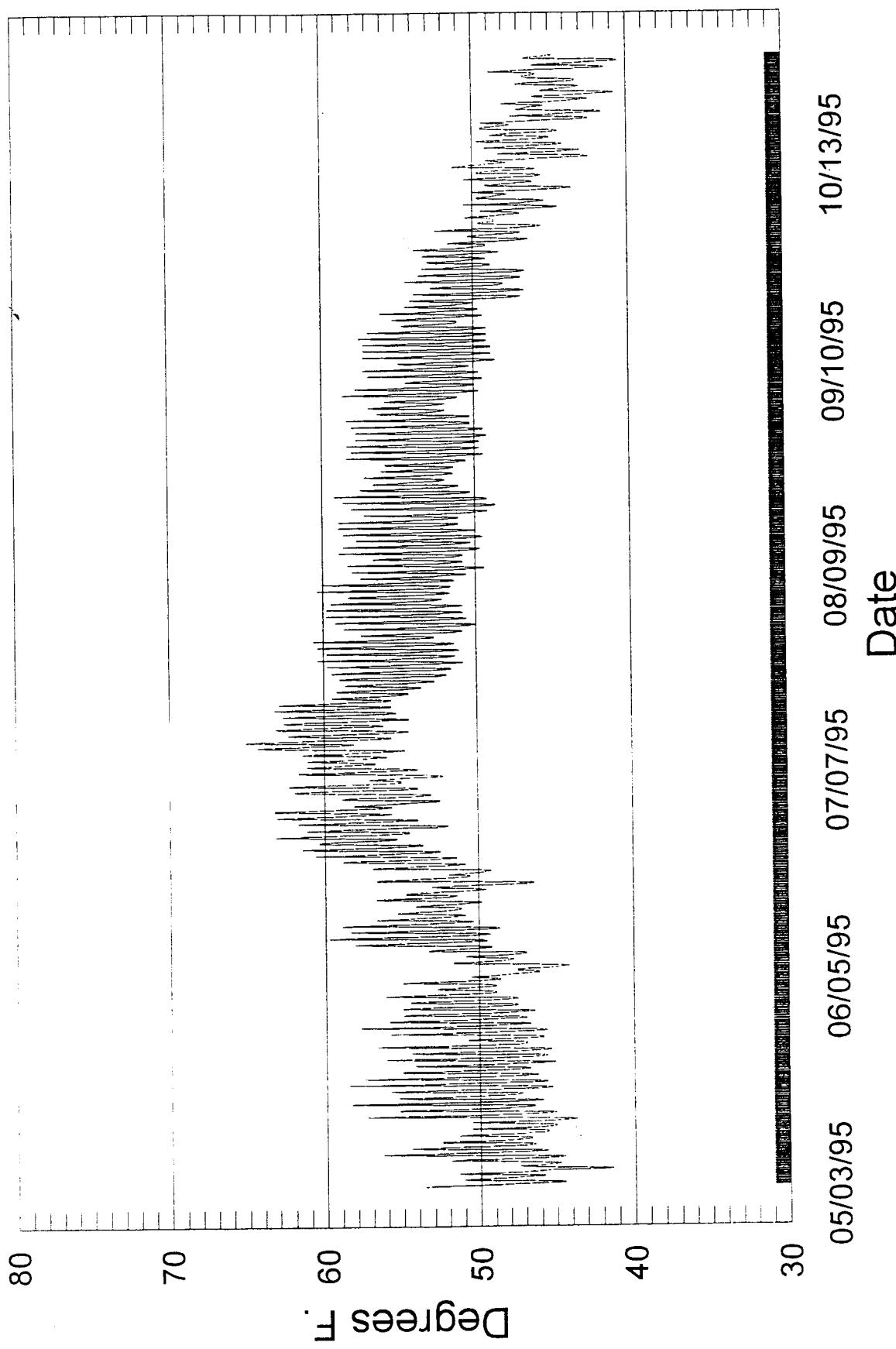
# Burnt Creek

## 1995 HOBO Temperatures

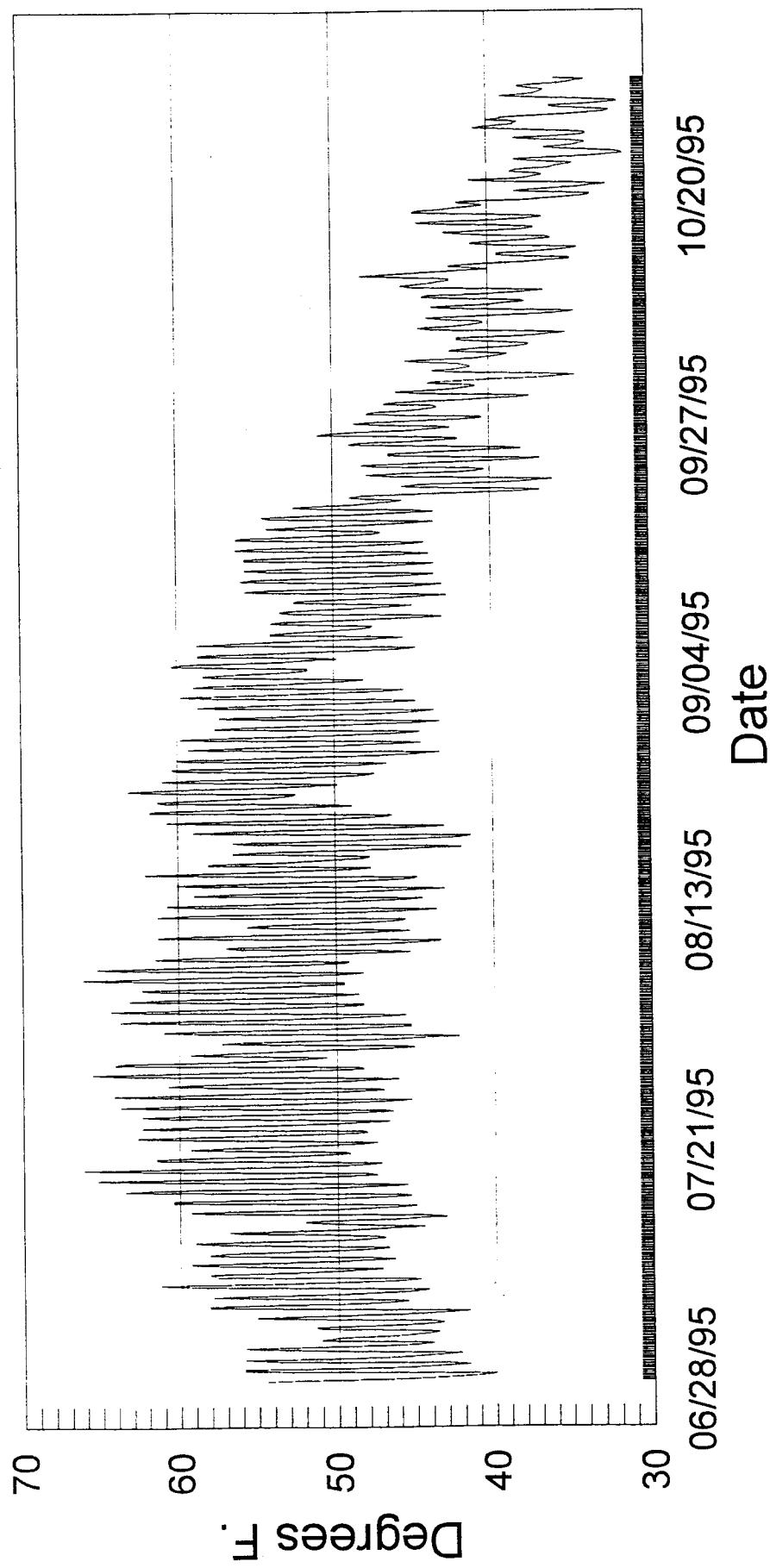


**Pahsimeroi River below Downton Lane Bridge**  
**1995 HOBO Temperatures**

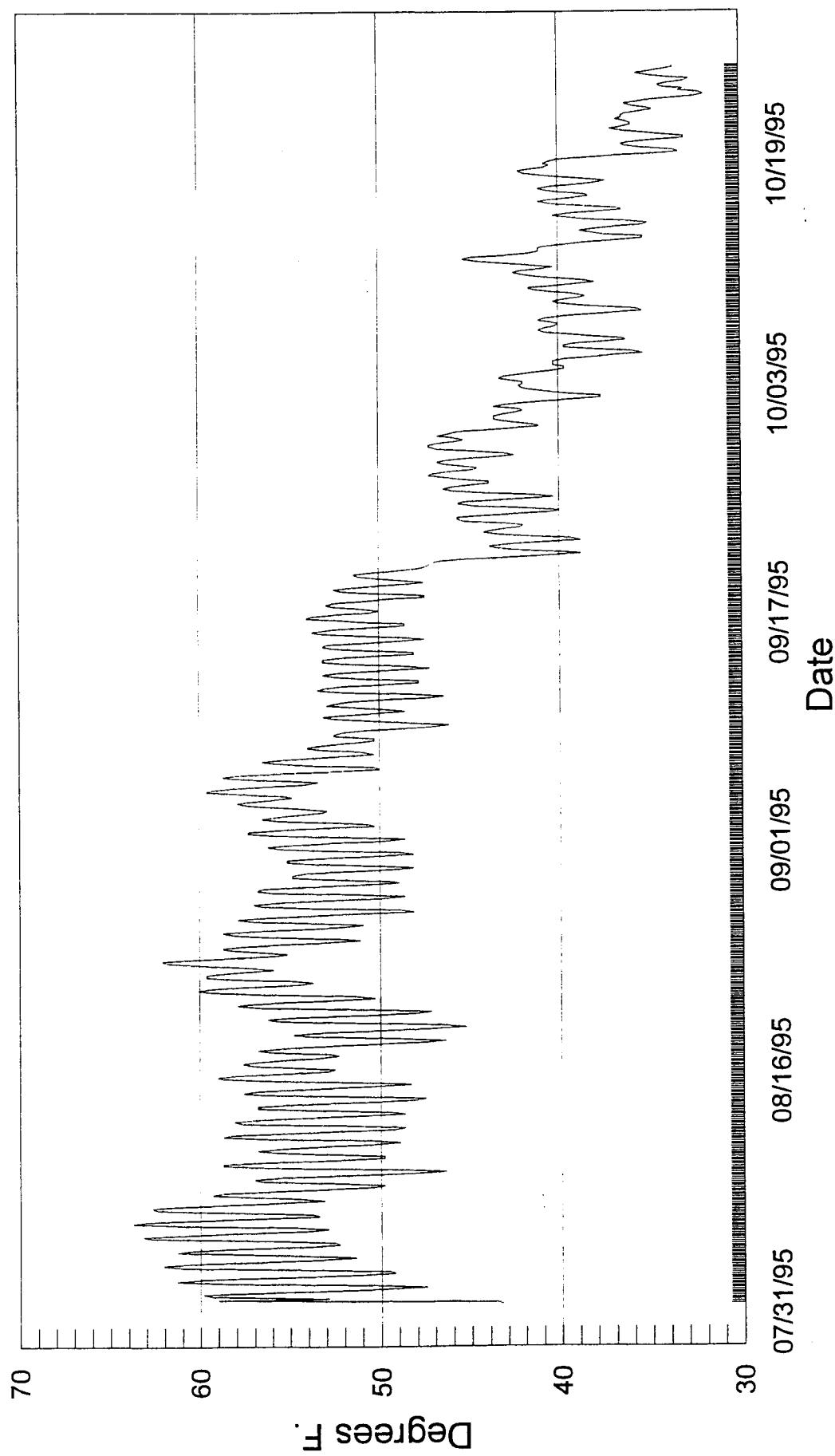
Appendix D. Continued.



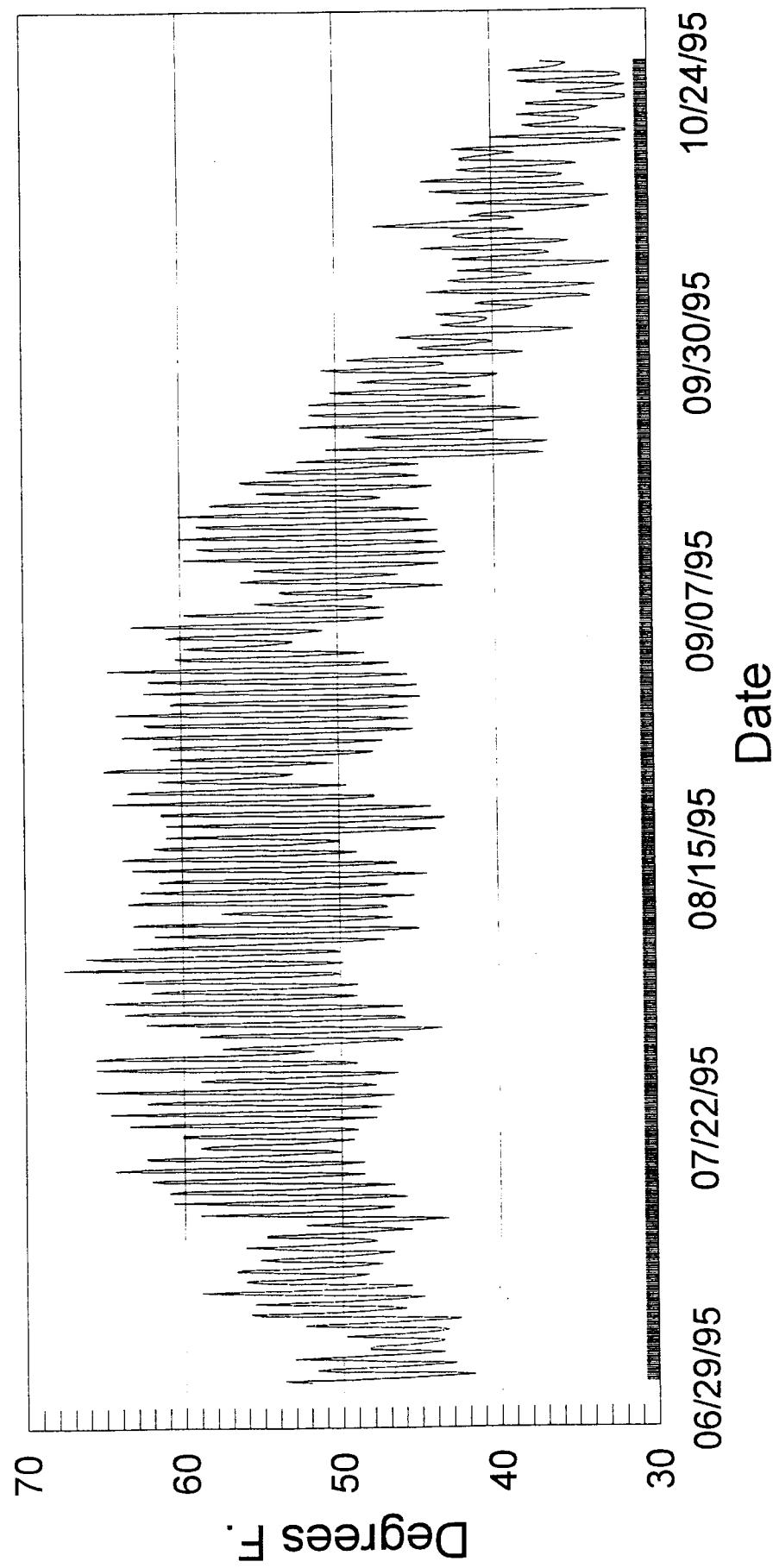
**Blackbird Creek**  
**1995 HOBO Temperatures**



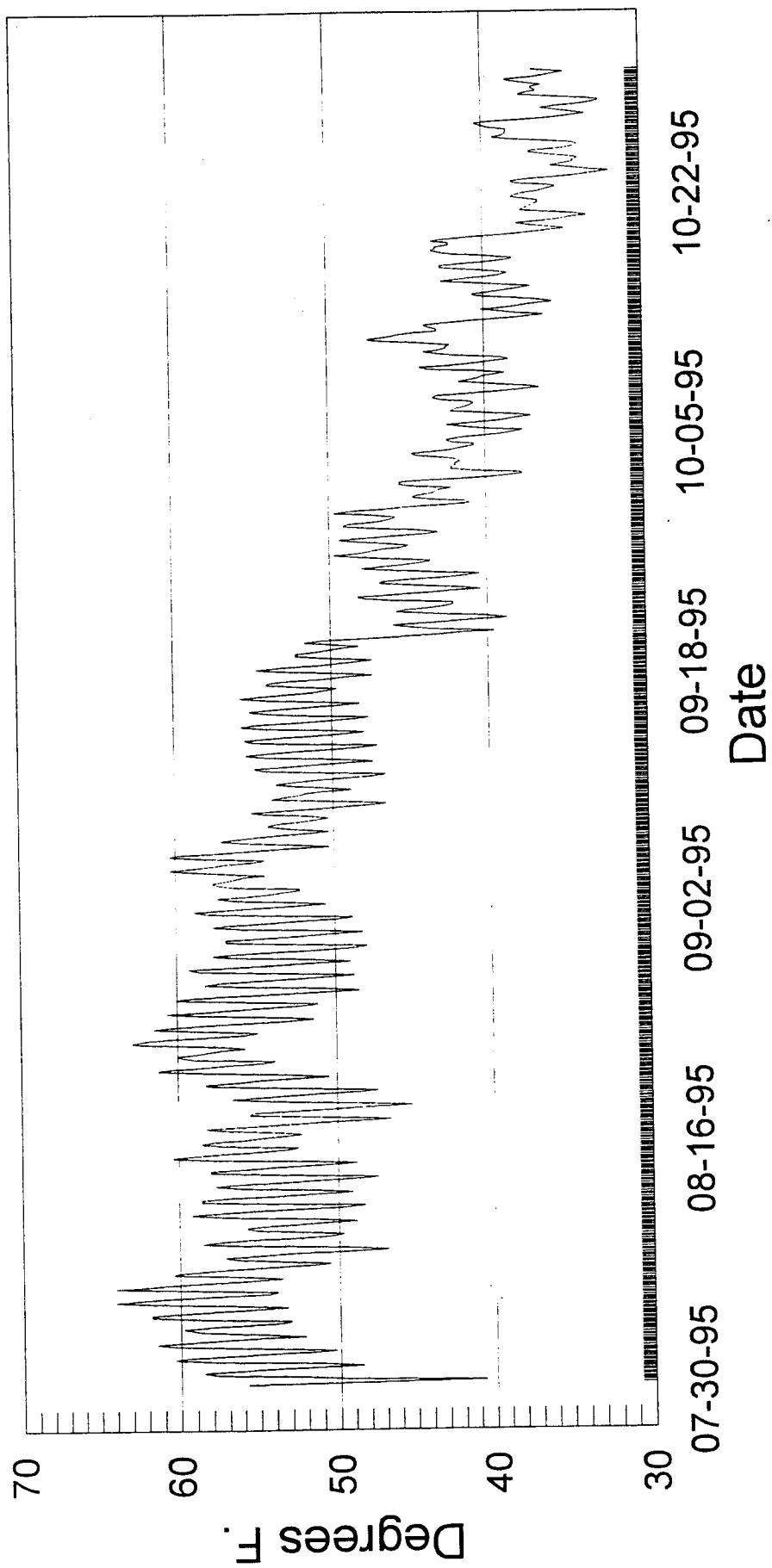
Napias Creek above Mouth  
1995 HOBO Temperatures



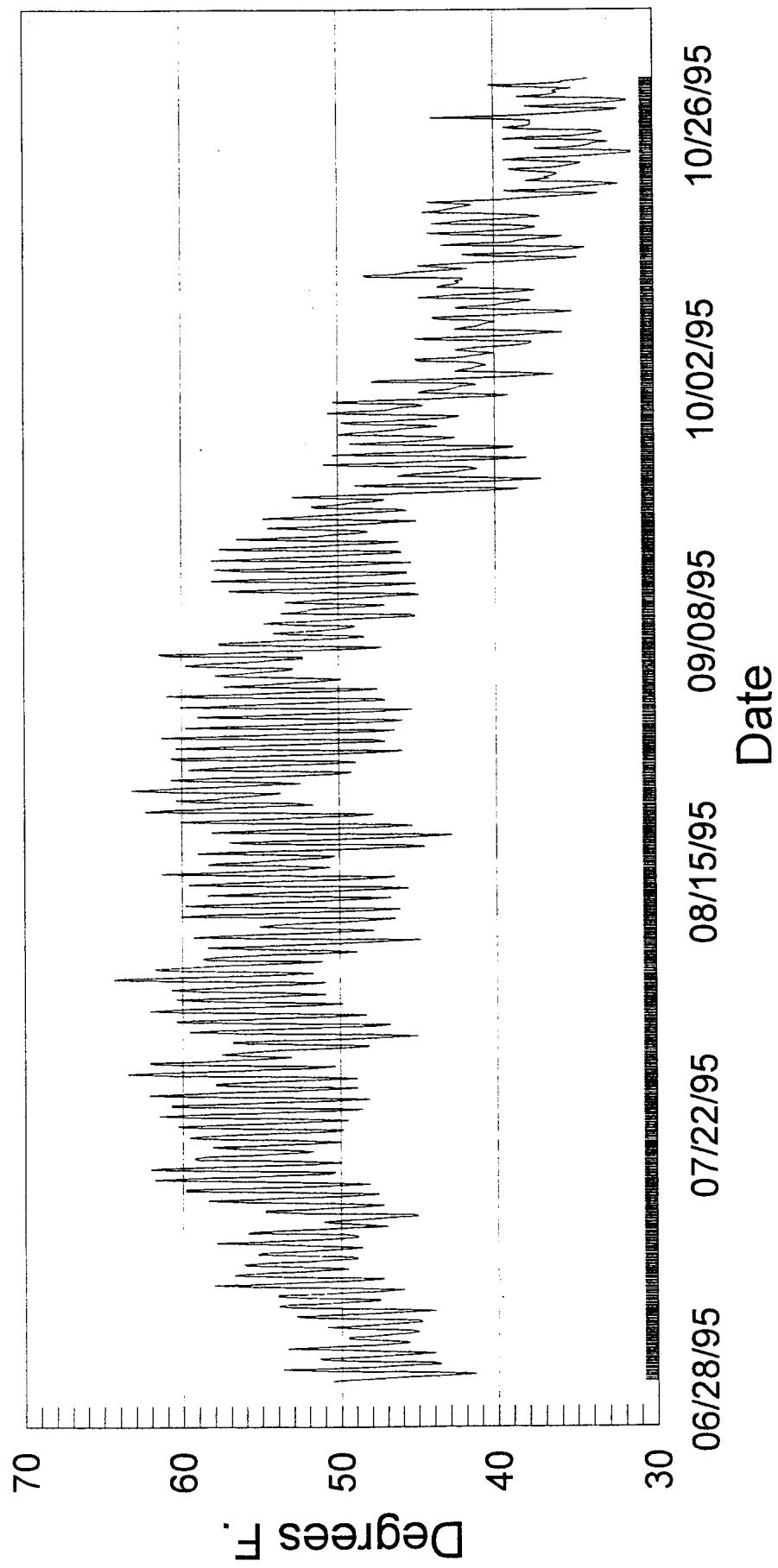
Napias Creek between Phelan & Moccasin  
1995 HOBO Temperatures



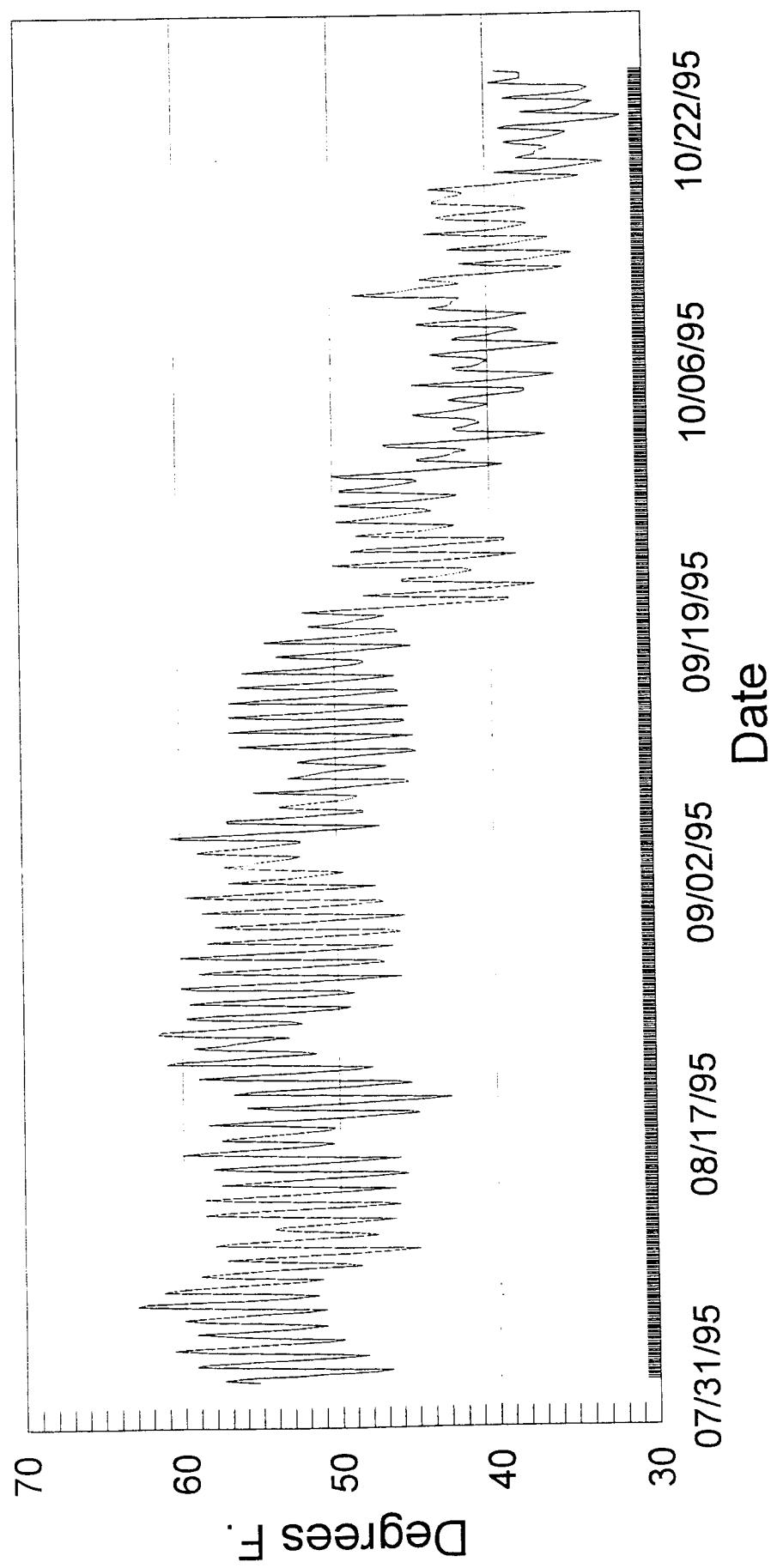
Panther Creek above Big Jureano Creek  
1995 HOBO Temperatures



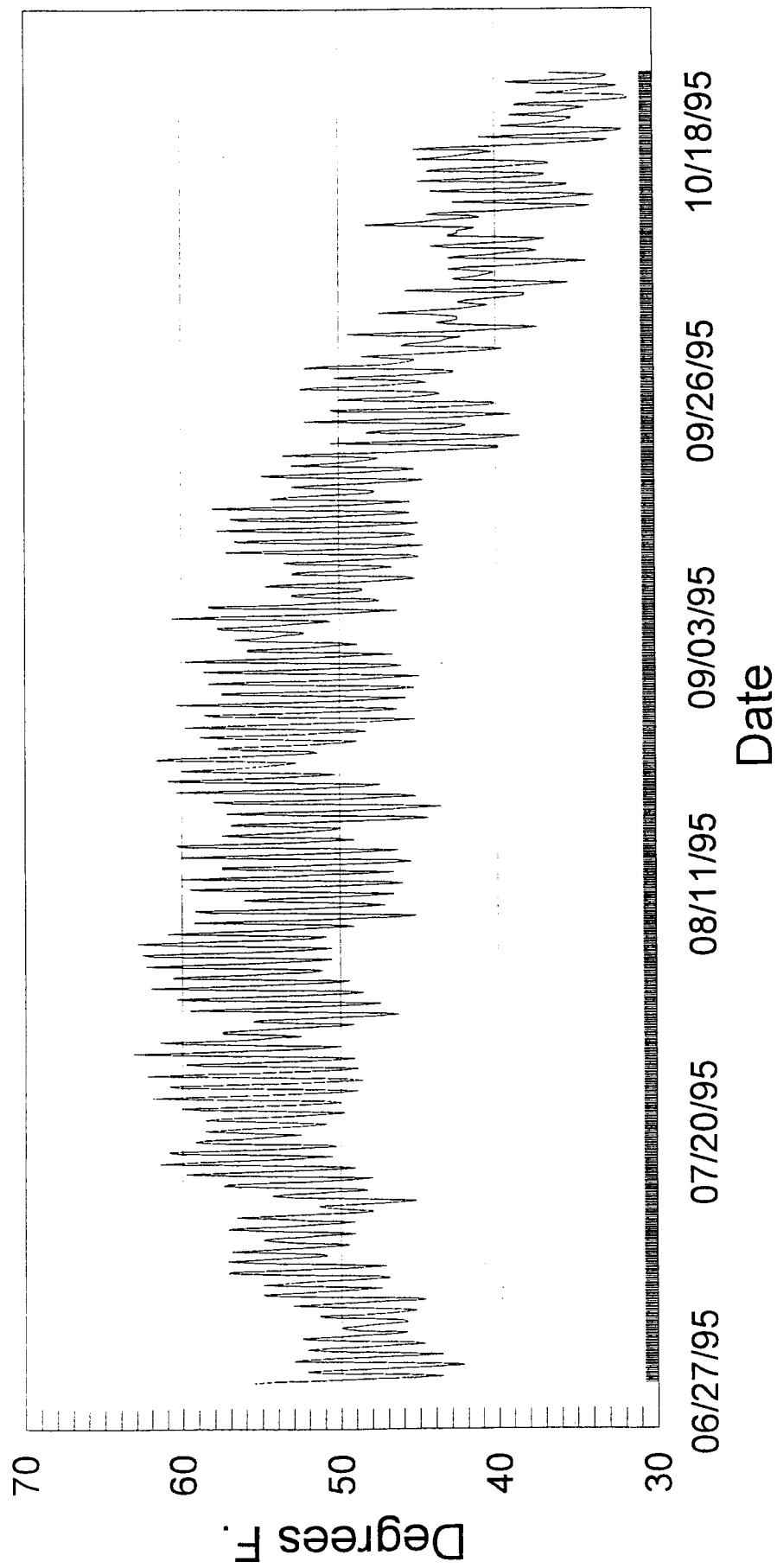
Panther Creek above Deep Creek  
1995 HOBO Temperatures



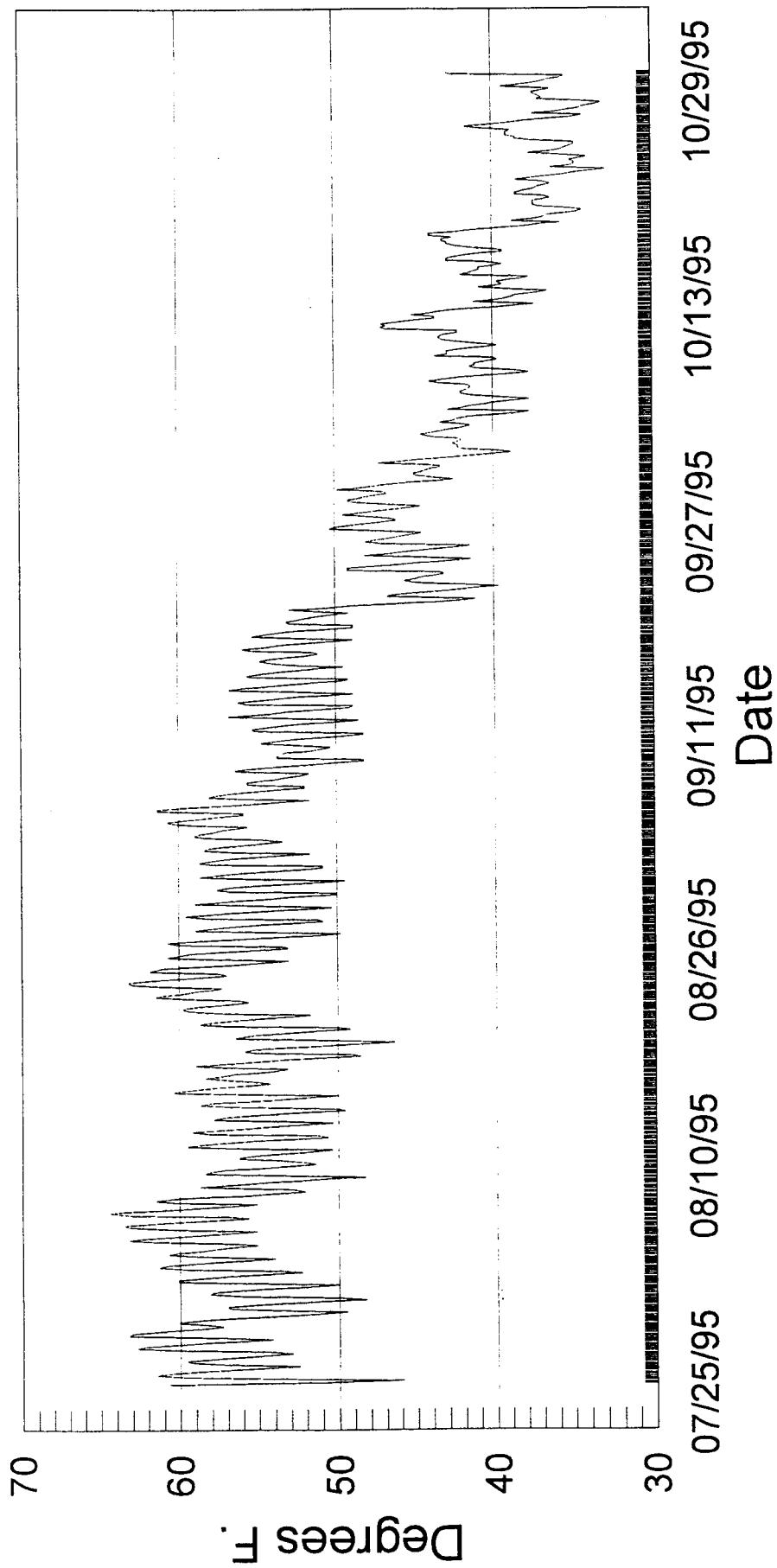
Panther Creek above Napias Creek  
1995 HOBO Temperatures



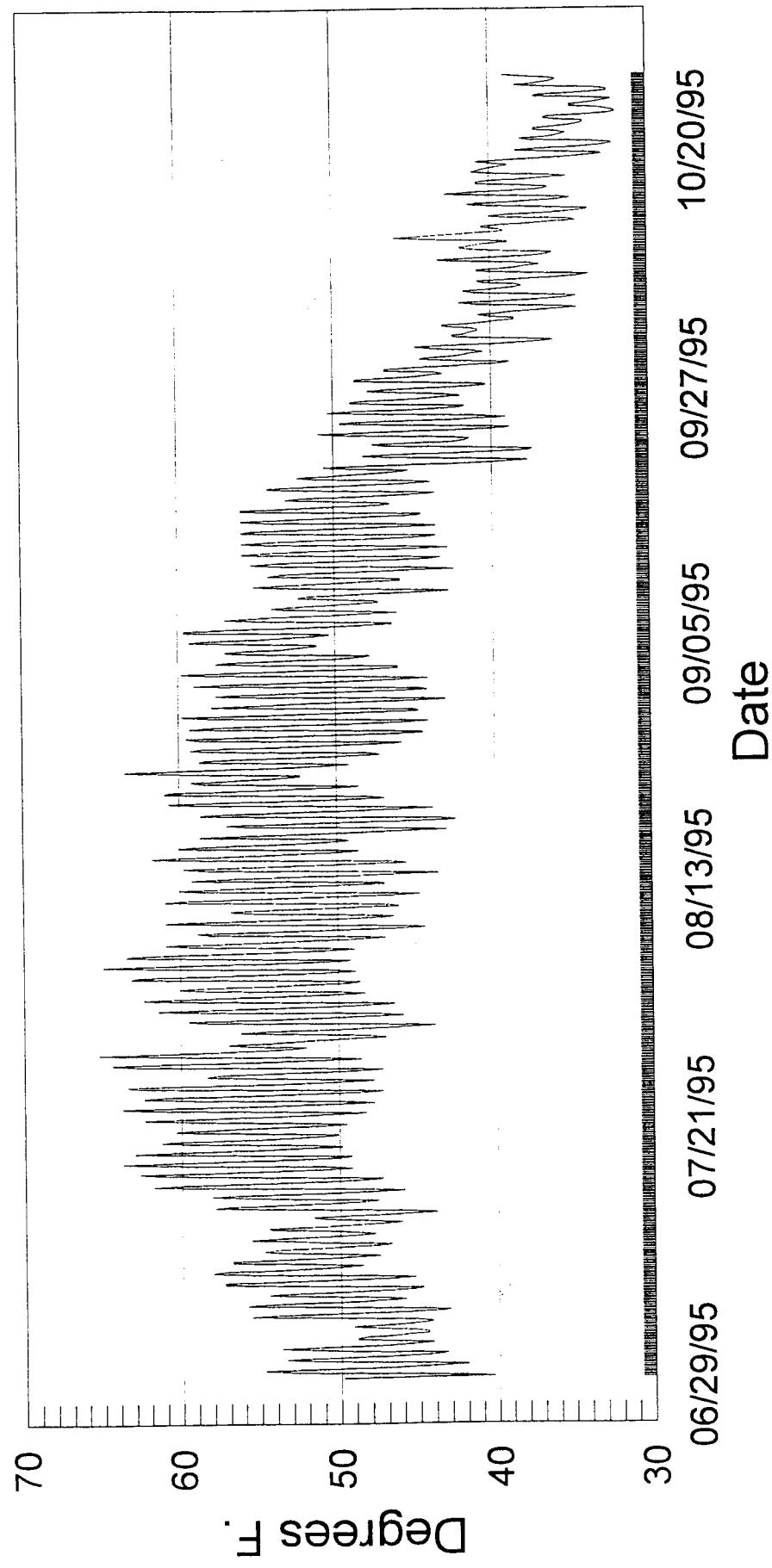
**Panther Creek above Porphyry Creek**  
**1995 HOBO Temperatures**



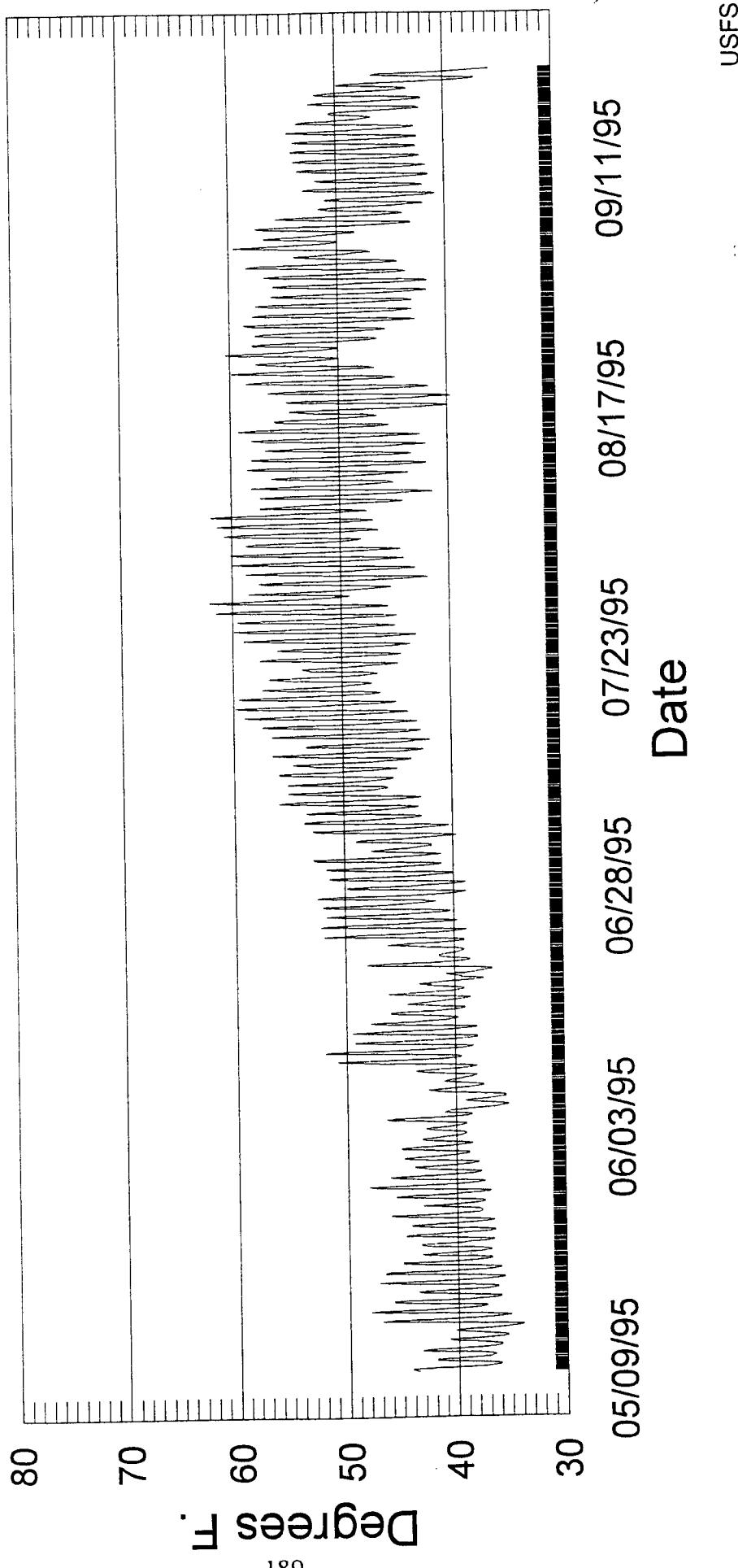
Panther Creek at Fritzer Gulch  
1995 HOBO Temperatures



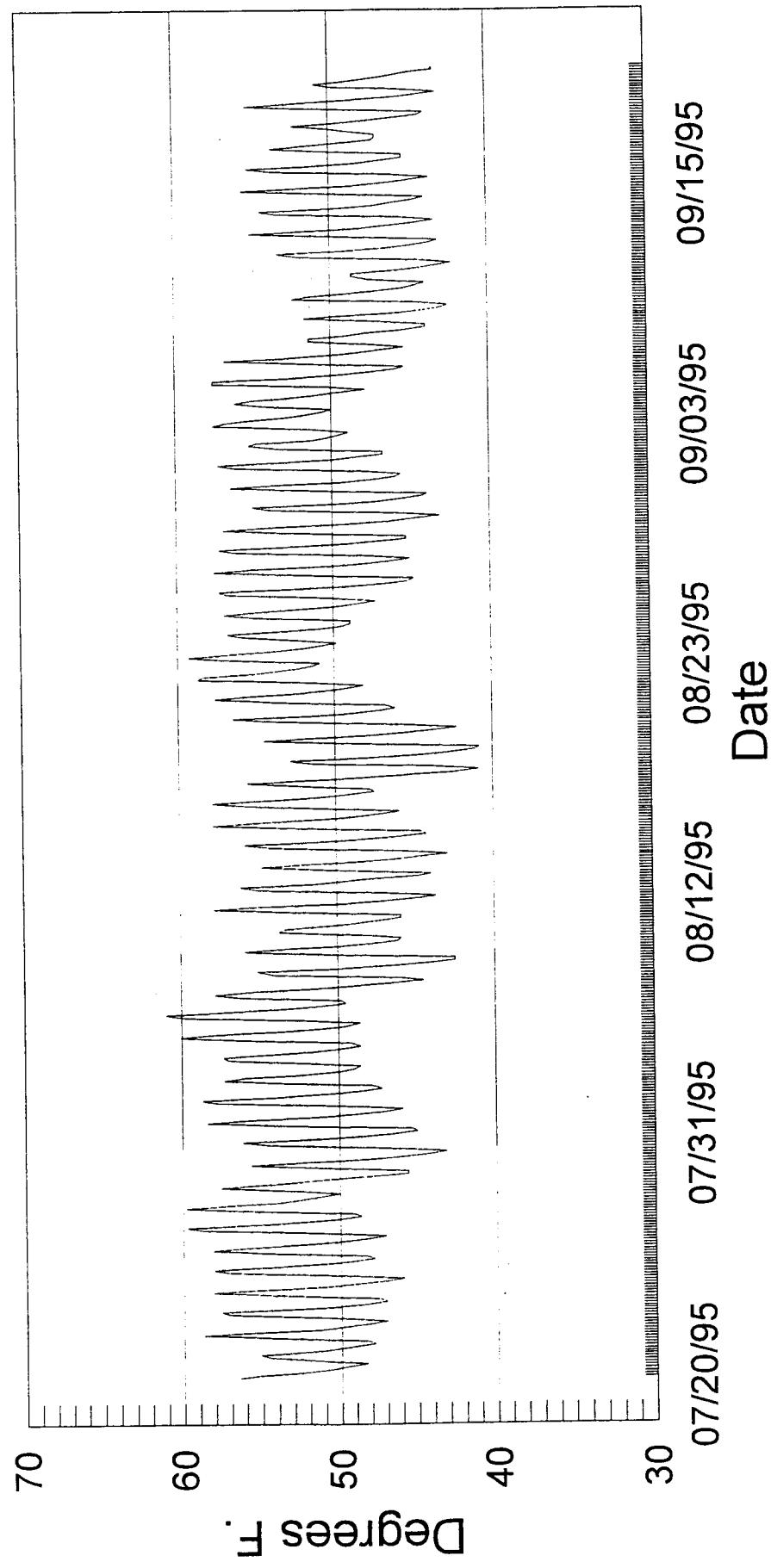
**Phelan Creek**  
**1995 HOBO Temperatures**



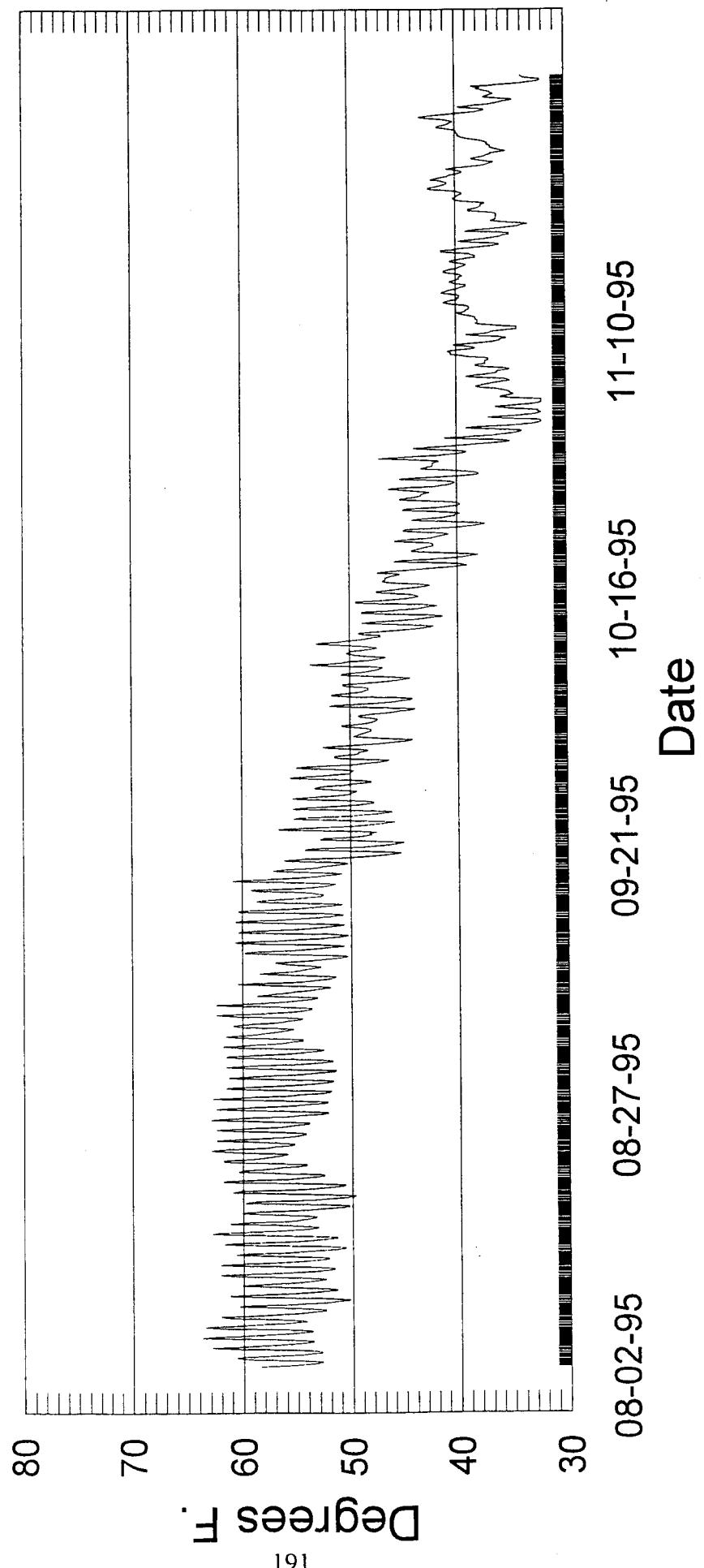
## Lower Basin Creek 1995 HOBO Temperatures



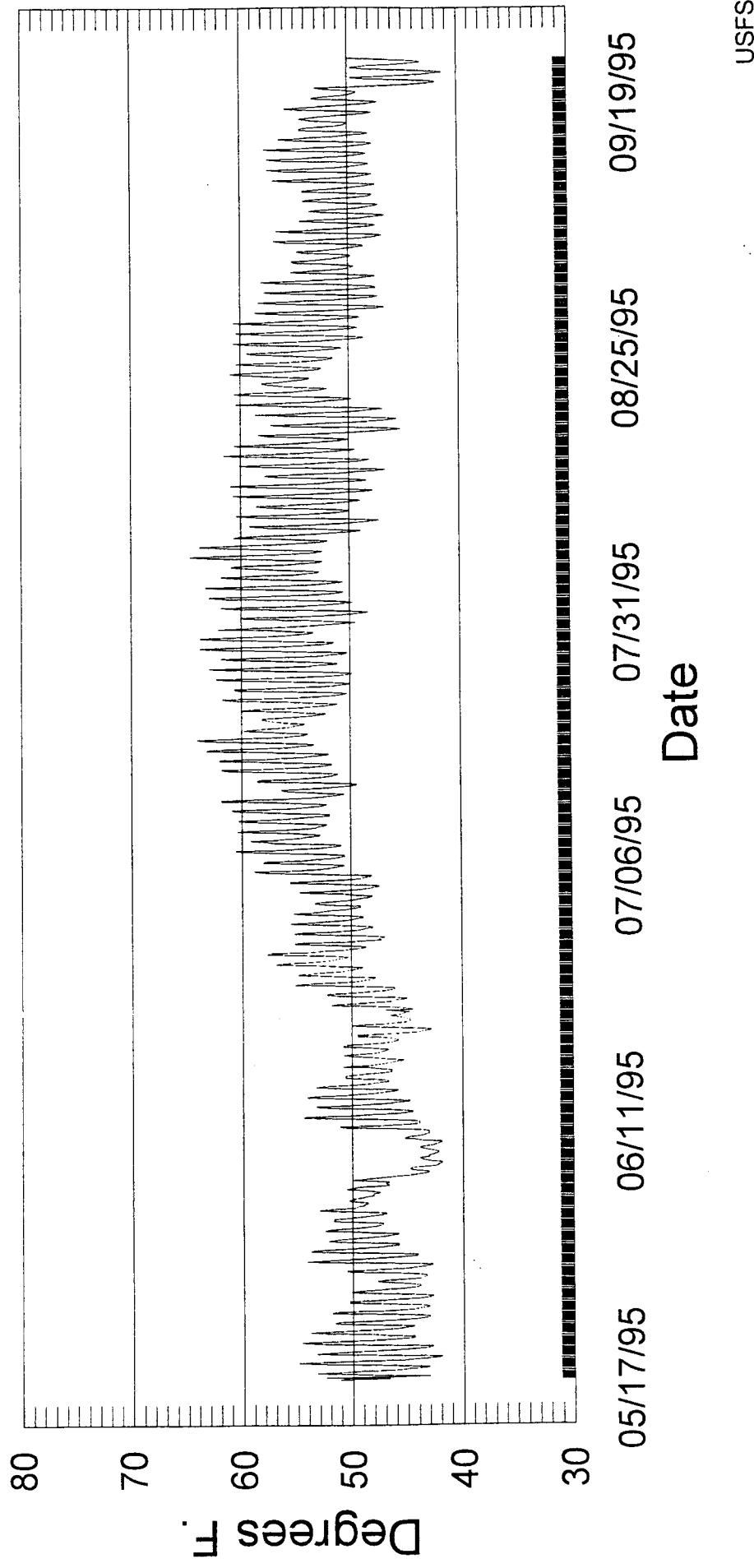
**Big Hat Creek**  
**1995 HOBO Temperatures**



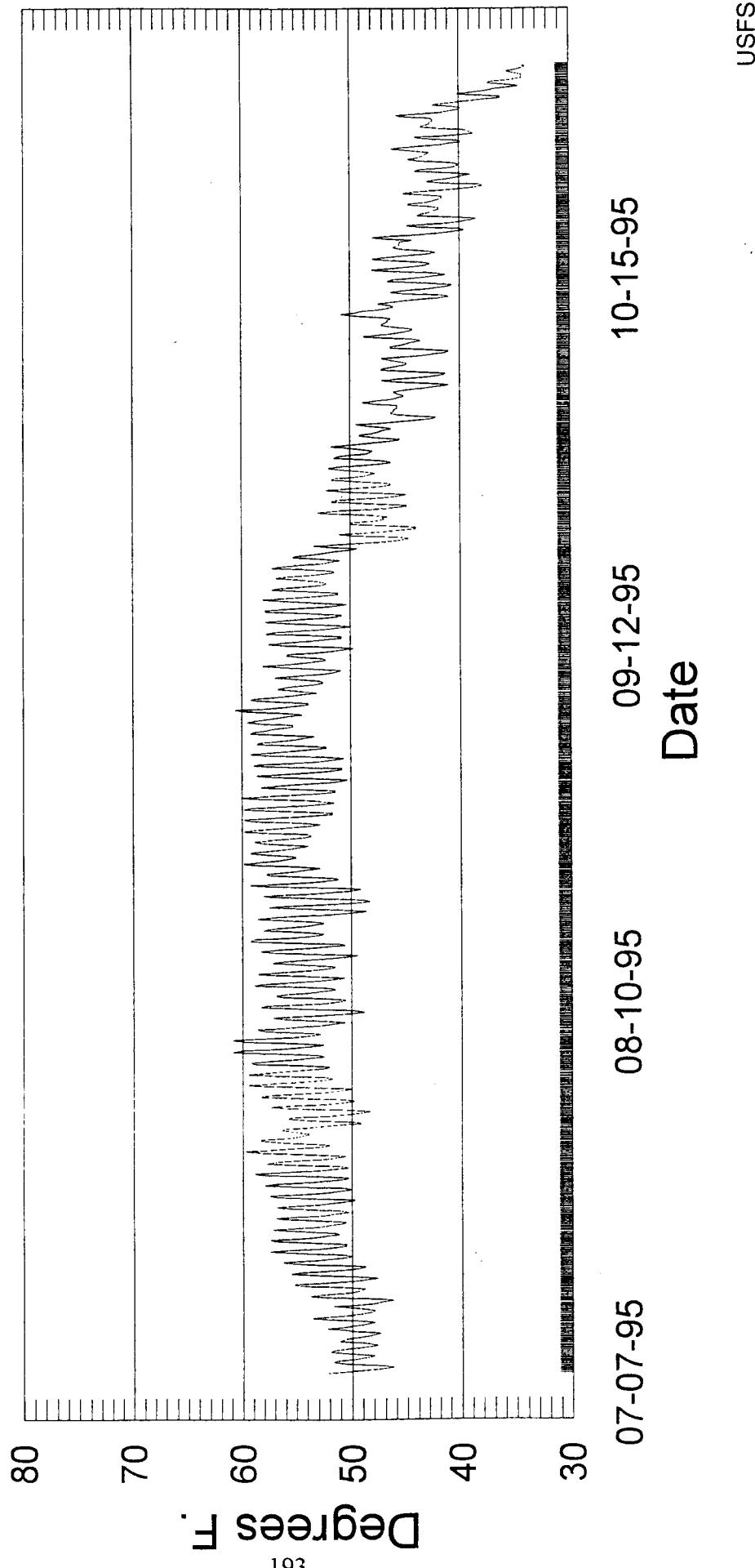
## Lower Carmen Creek 1995 HOBO Temperatures



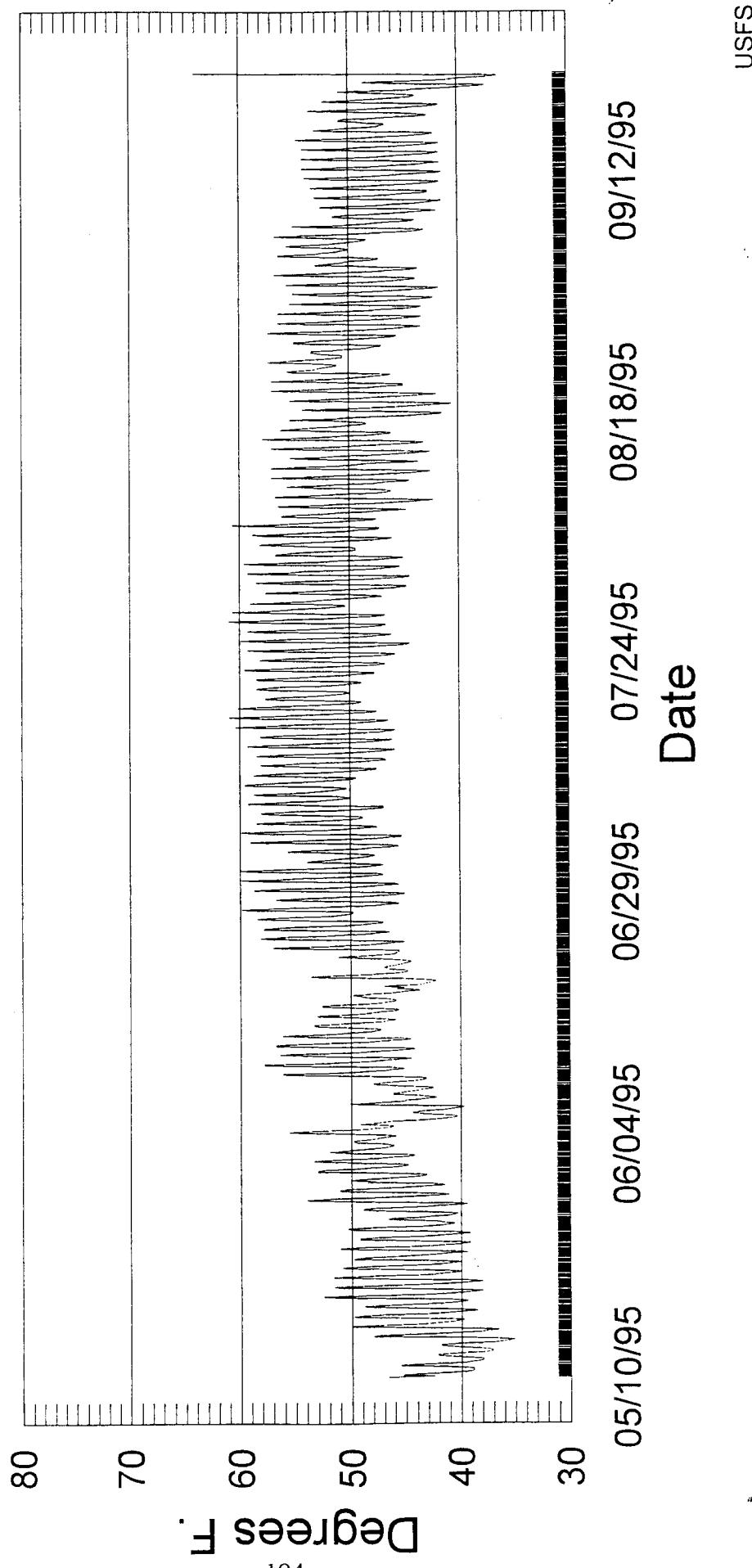
# Challis Creek 1995 HOBO Temperatures



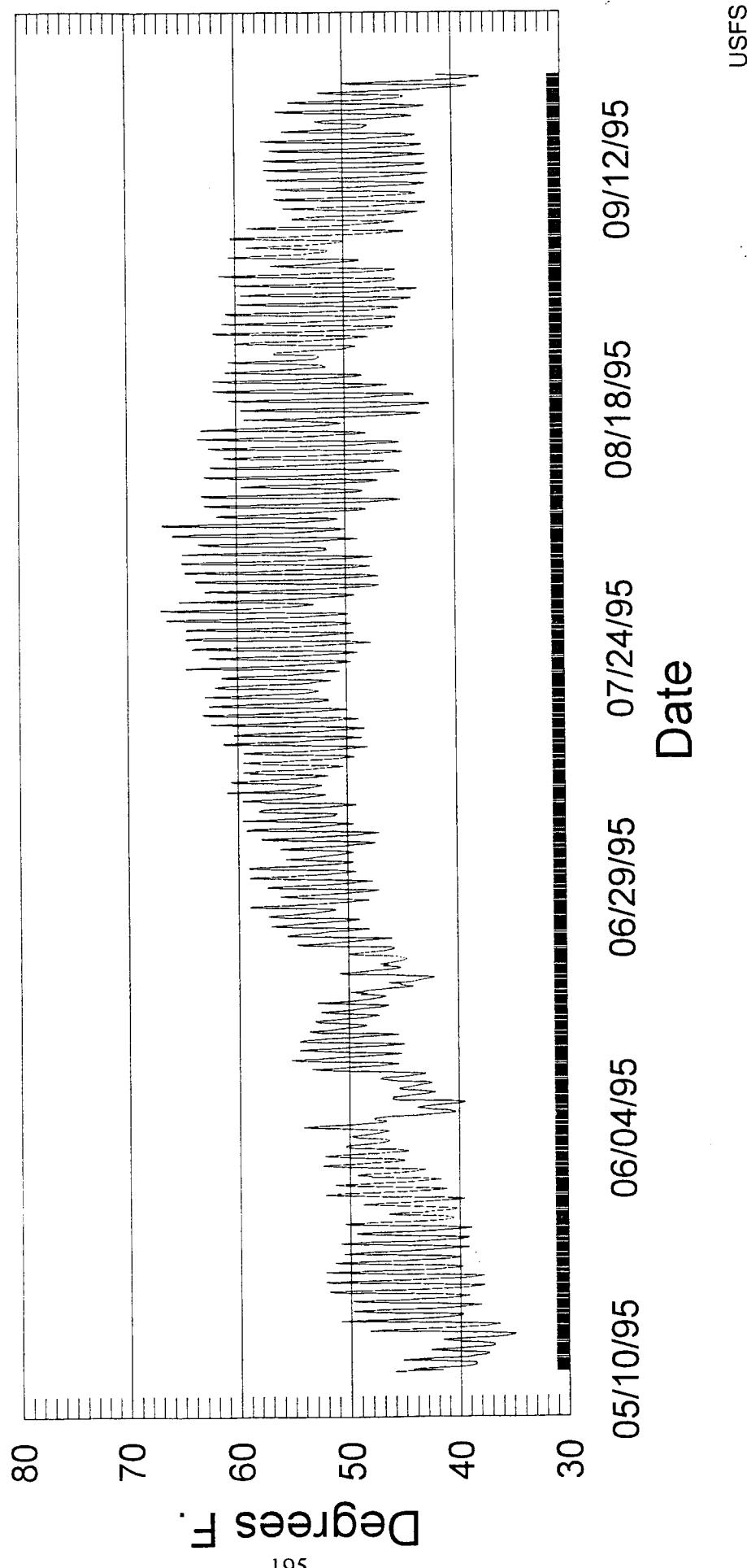
## Lower Fourth of July Creek 1995 HOBO Temperatures



## Lower Joe's Gulch 1995 HOBO Temperatures

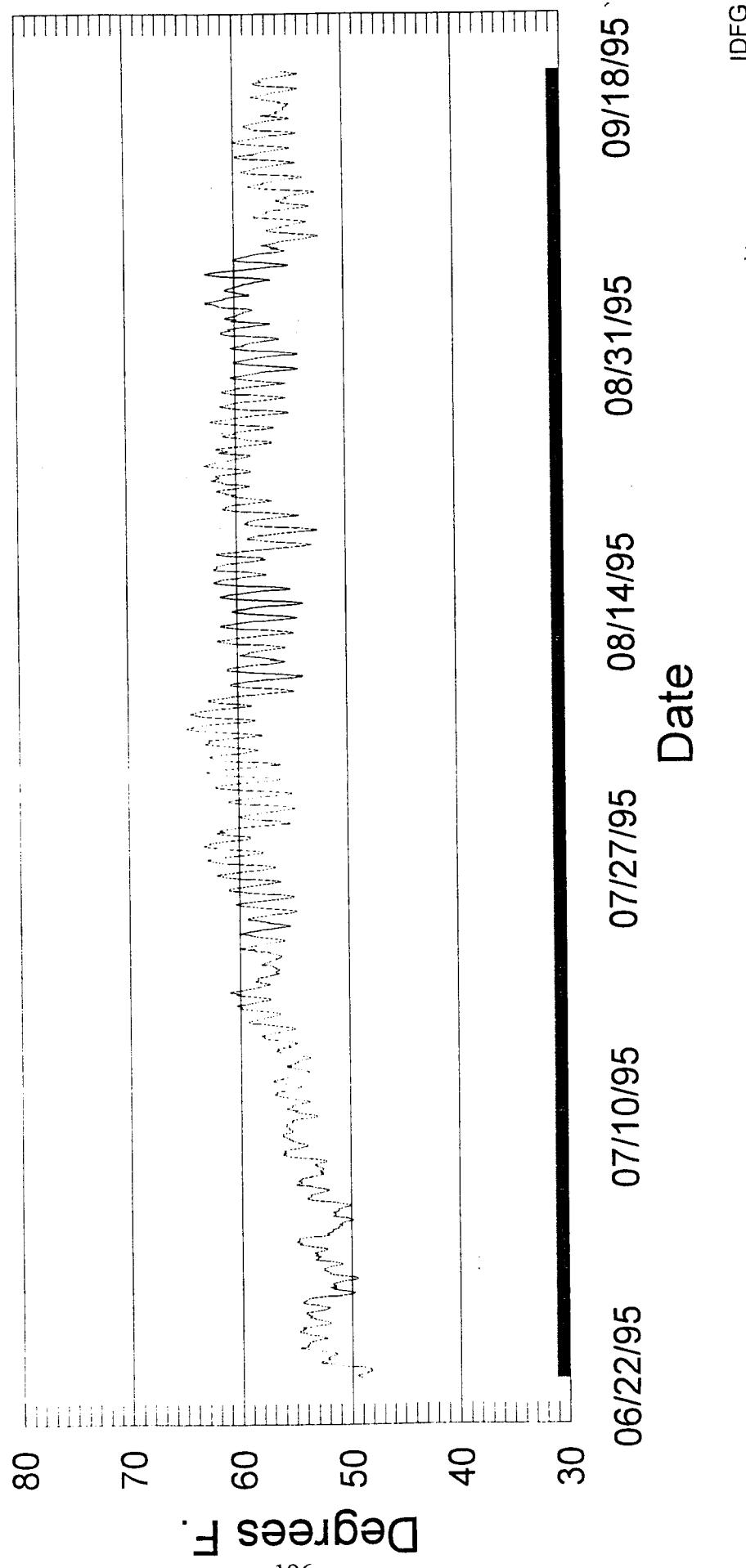


## Upper Joe's Gulch 1995 HOBO Temperatures

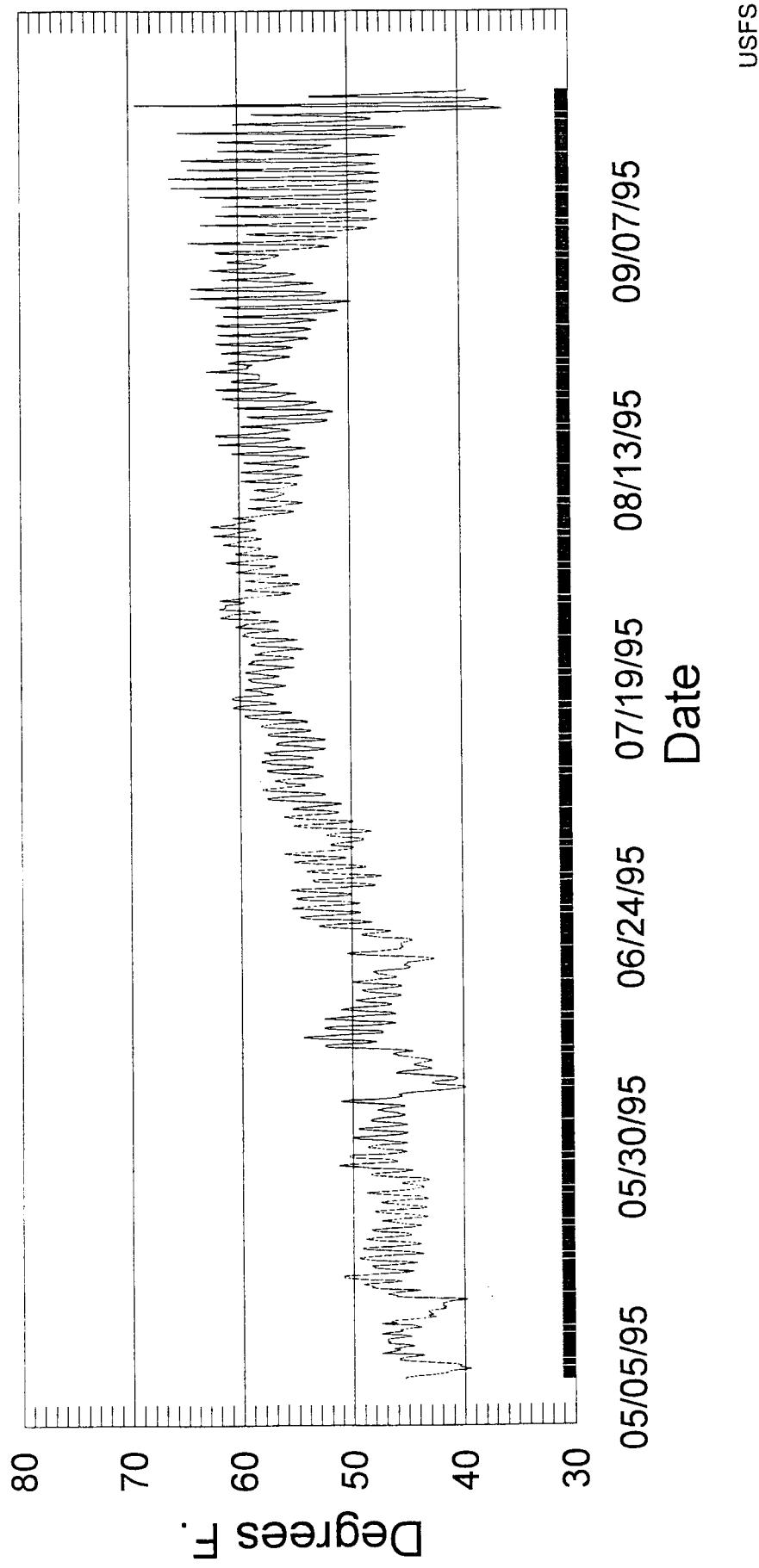


# Salmon River at Challis below Highway 93 Bridge

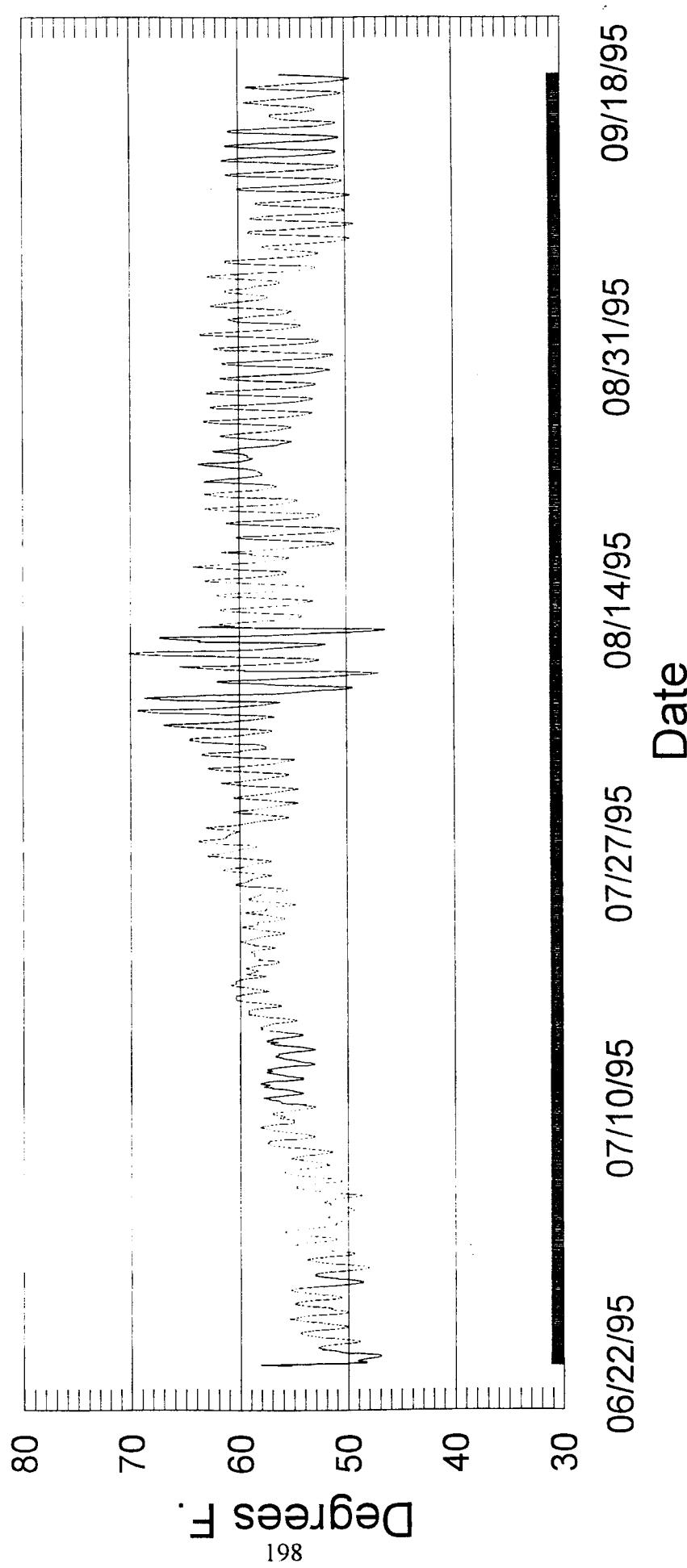
## 1995 HOBO Temperatures



**Salmon River behind Yankee Fork District Office**  
**1995 HOBO Temperatures**

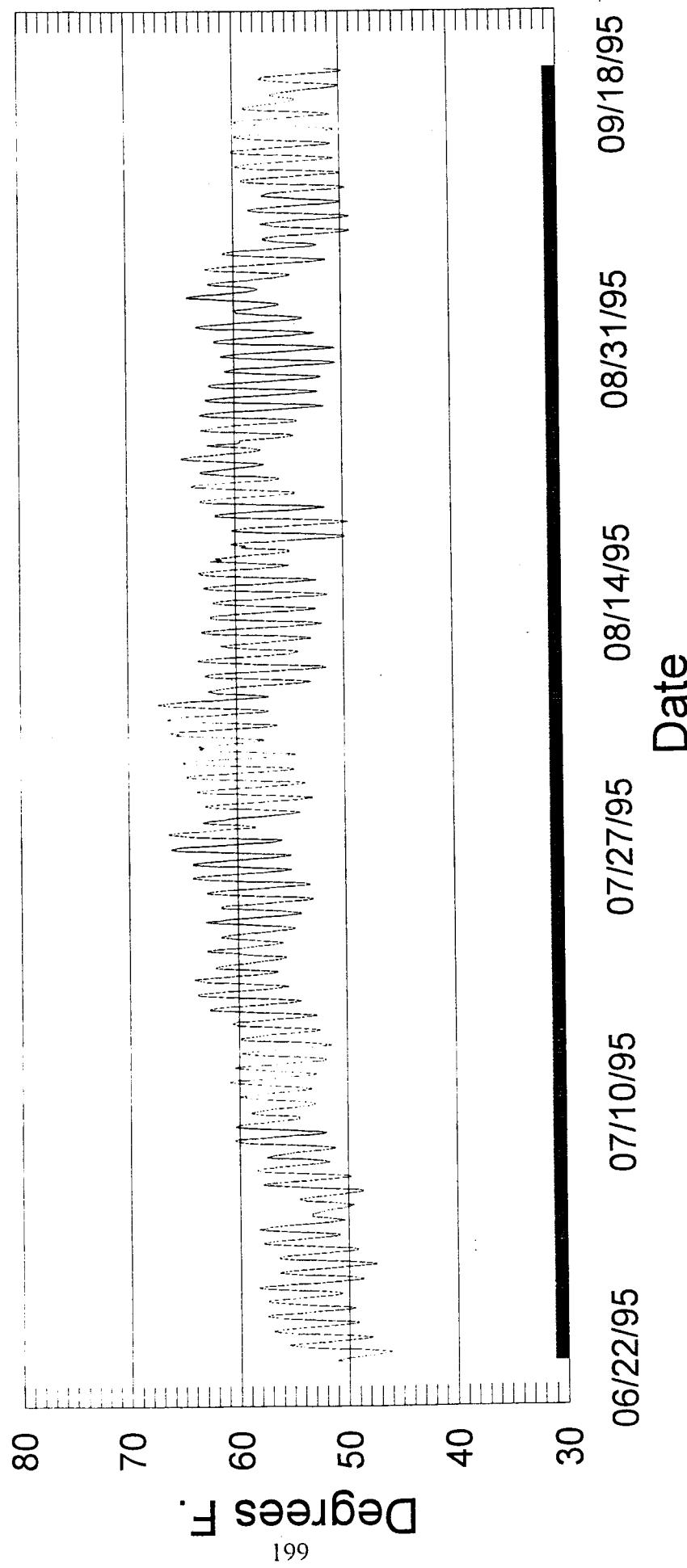


# Salmon River below Clayton at bridge 1995 HOBO Temperatures



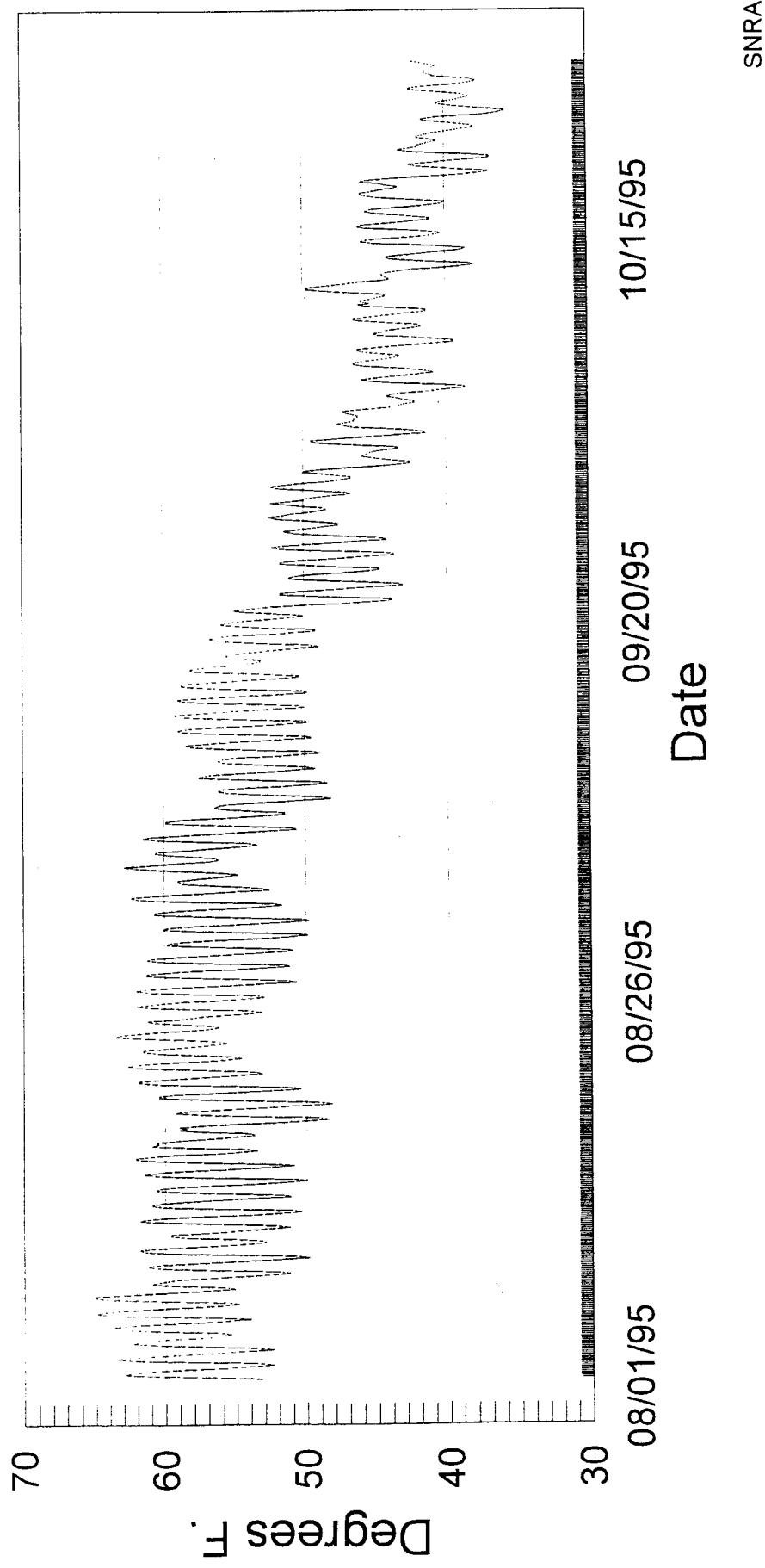
IDFG

# Salmon River below Yankee Fork 1995 HOBO Temperatures



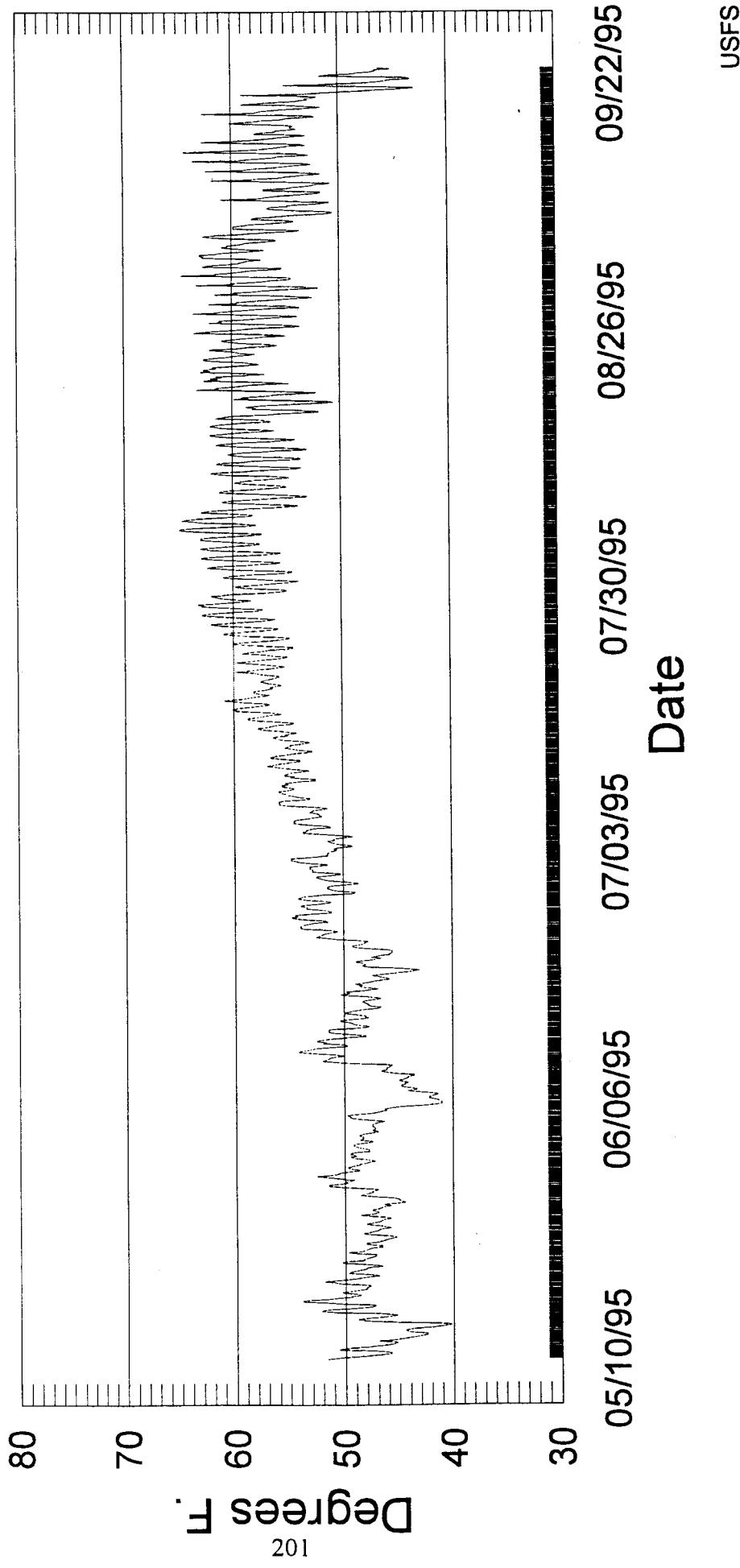
IDFG

Salmon River below Yankee Fork  
1995 HOBO Temperatures



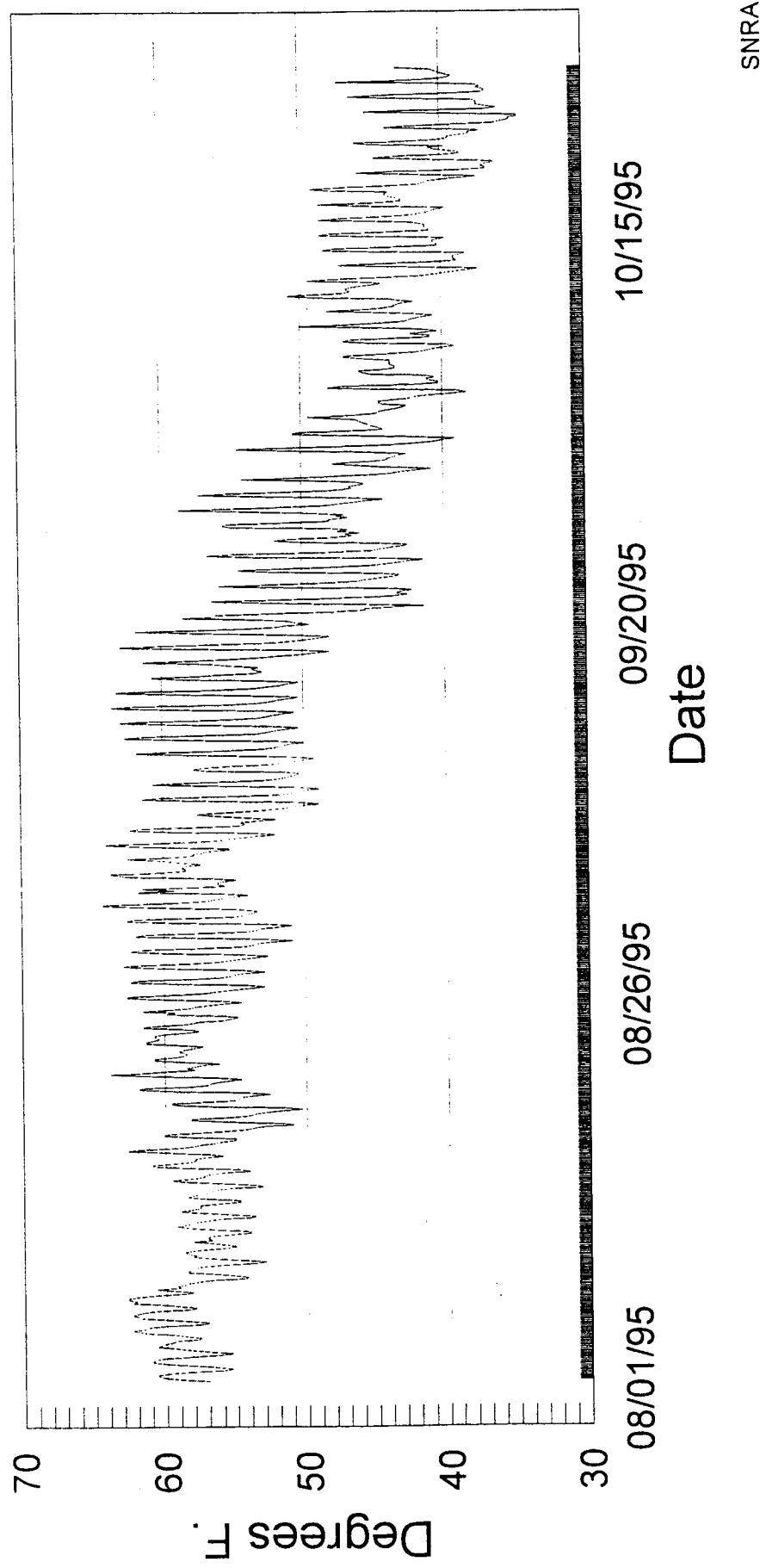
# Upper Salmon River near Highway 75 Milepost 241

## 1995 HOBO Temperatures



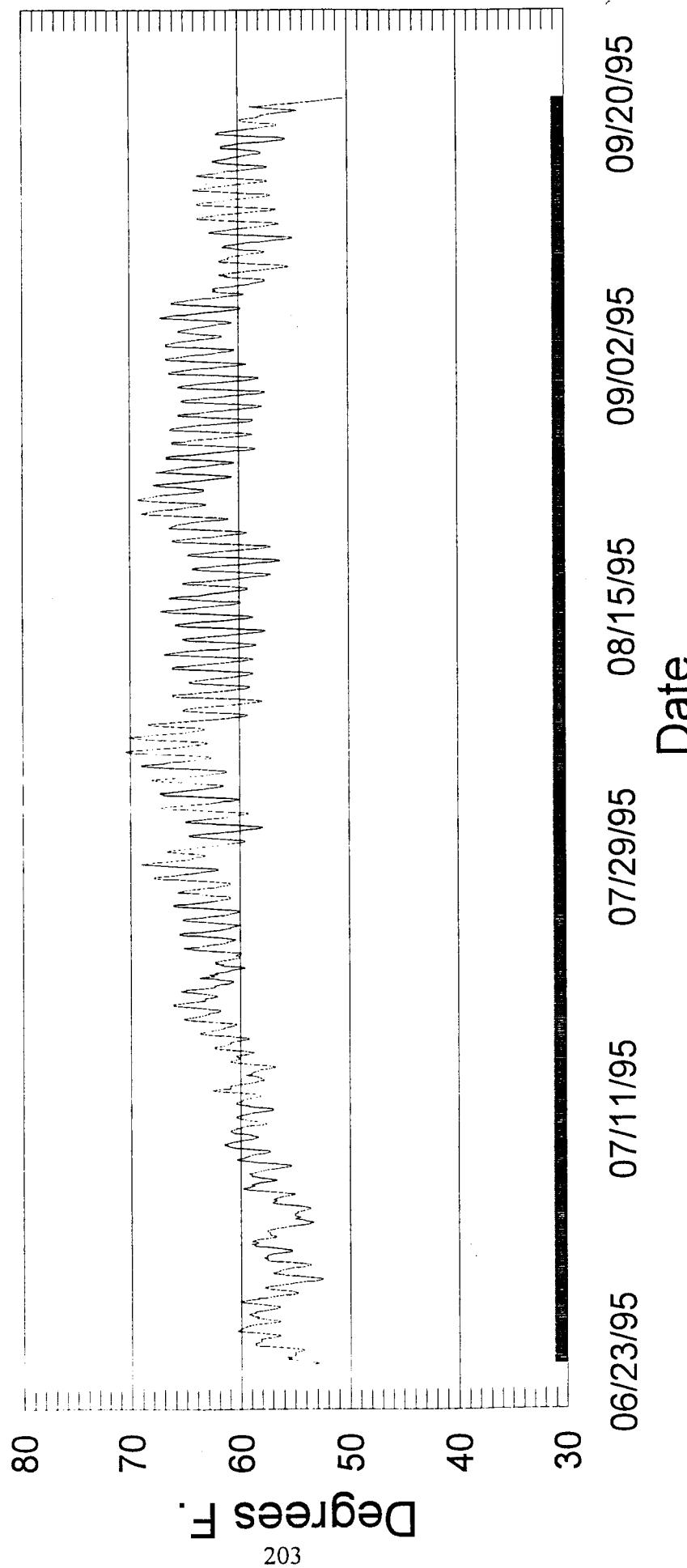
USFS

**Salmon River near Torrey's Hole**  
**1995 HOBO Temperatures**



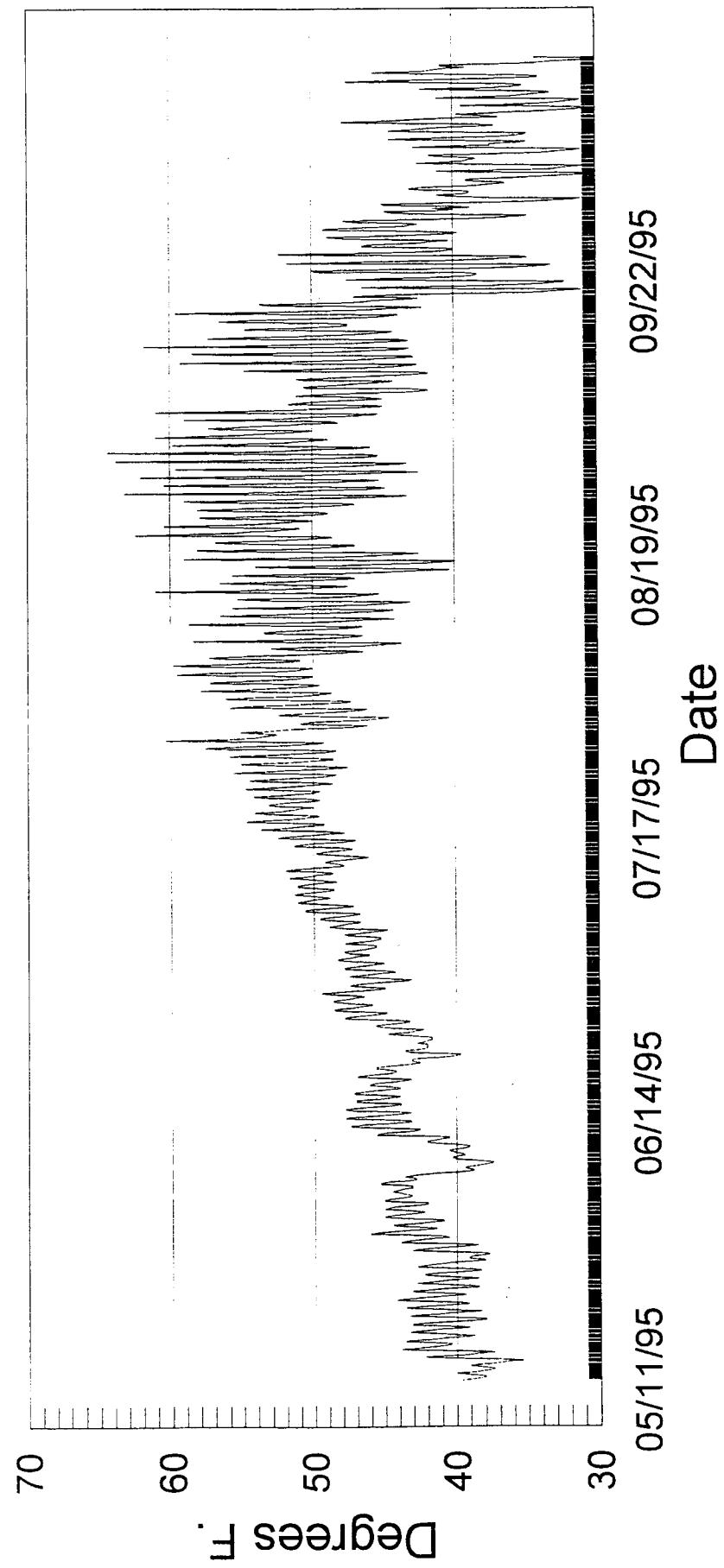
# Salmon River upstream of Lemhi River

## 1995 HOBO Temperatures



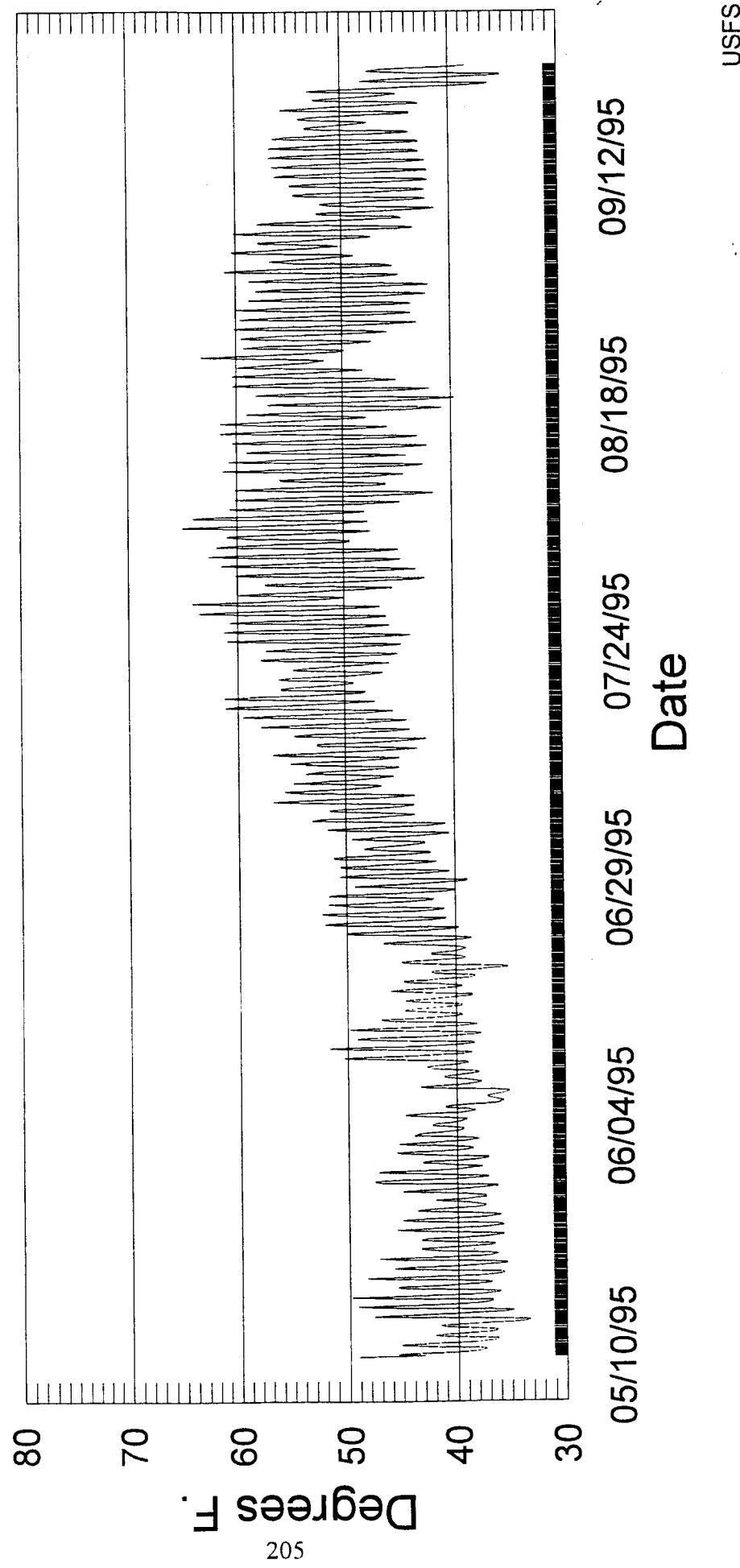
IDFG

**South Fork Williams Creek \***  
**1995 HOBO Temperatures**

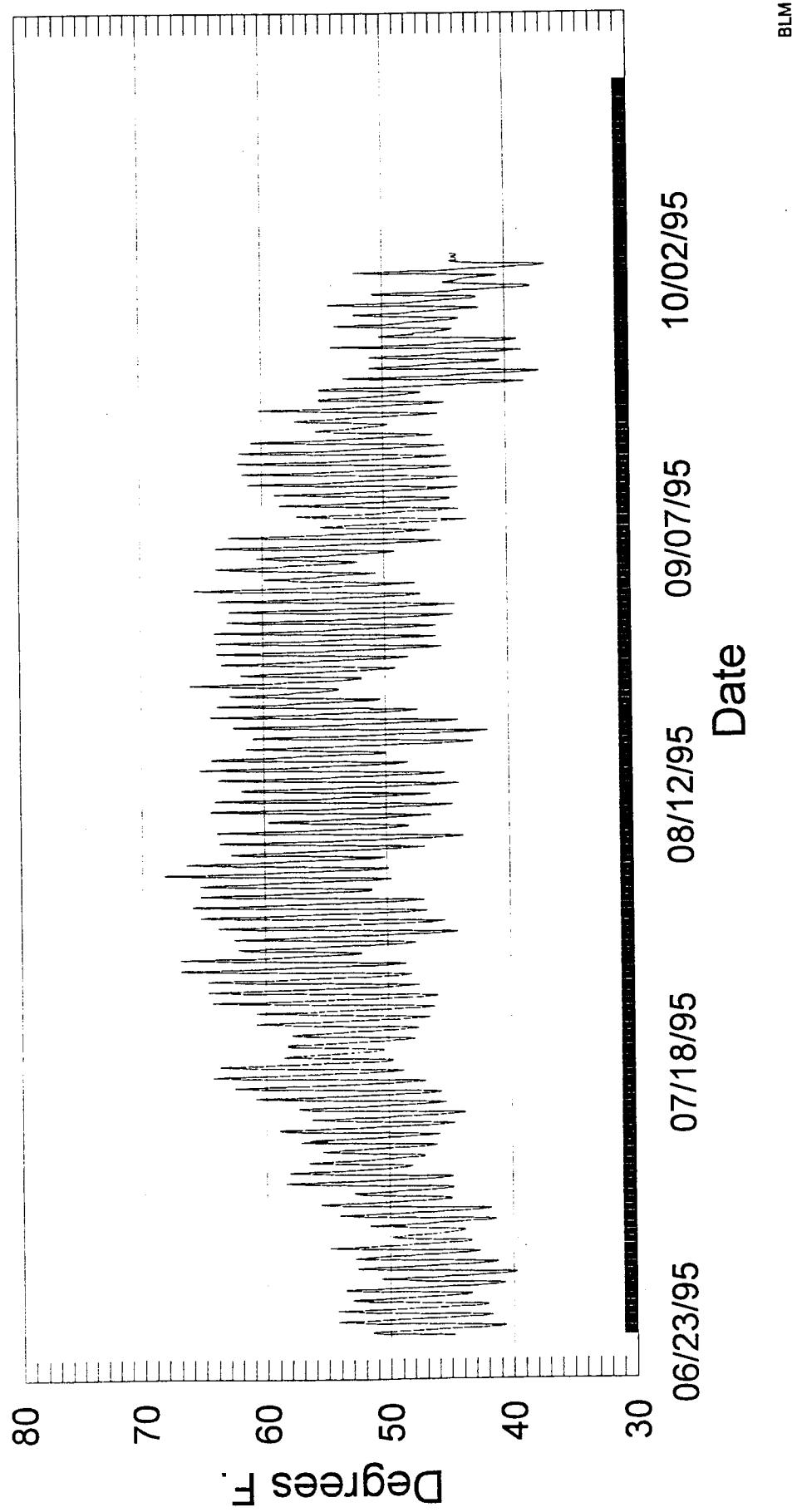


\* HOBO found out of water.

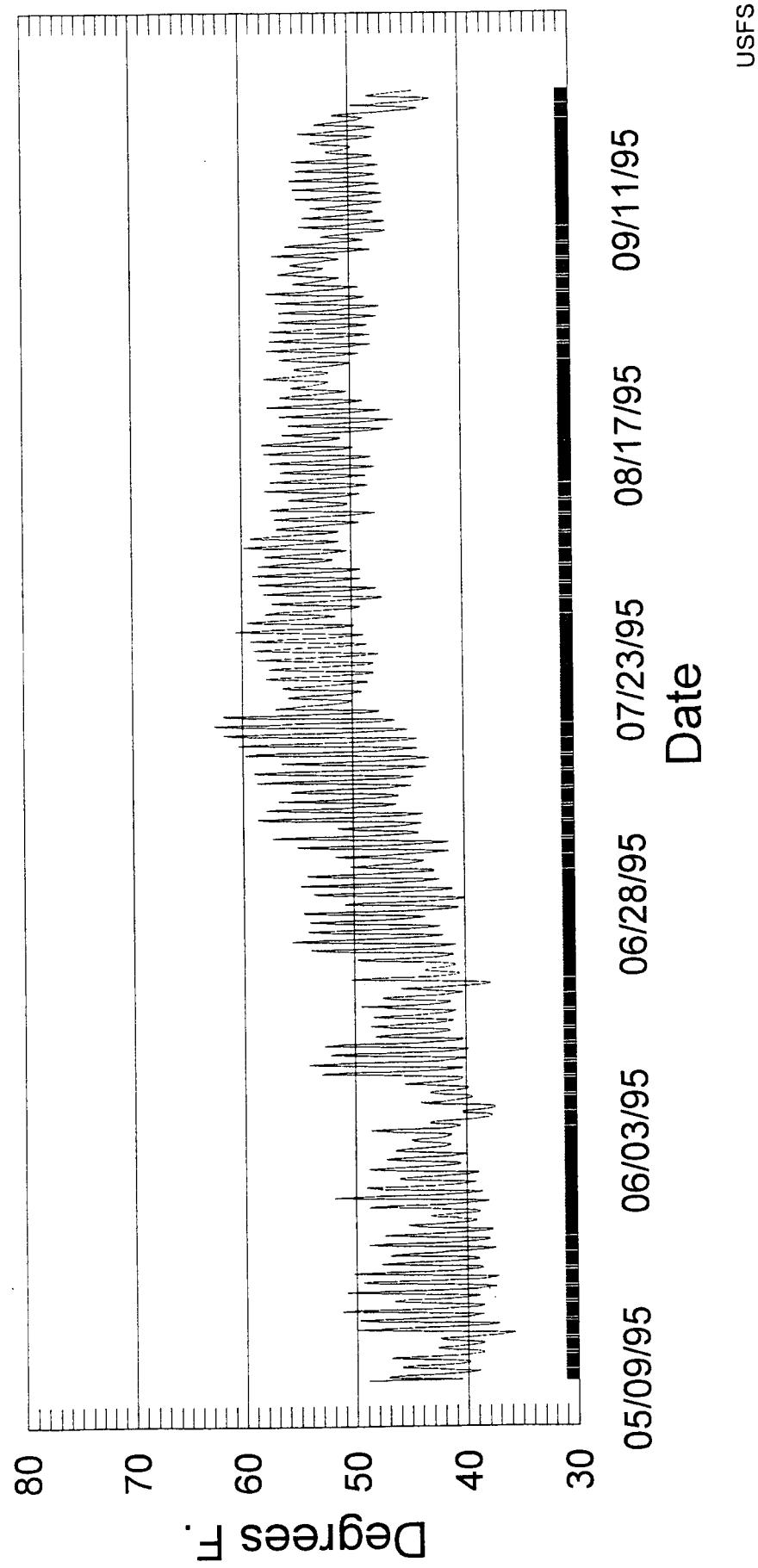
# Squaw Creek 1995 HOBO Temperatures



Squaw Creek  
1995 HOBO Temperatures

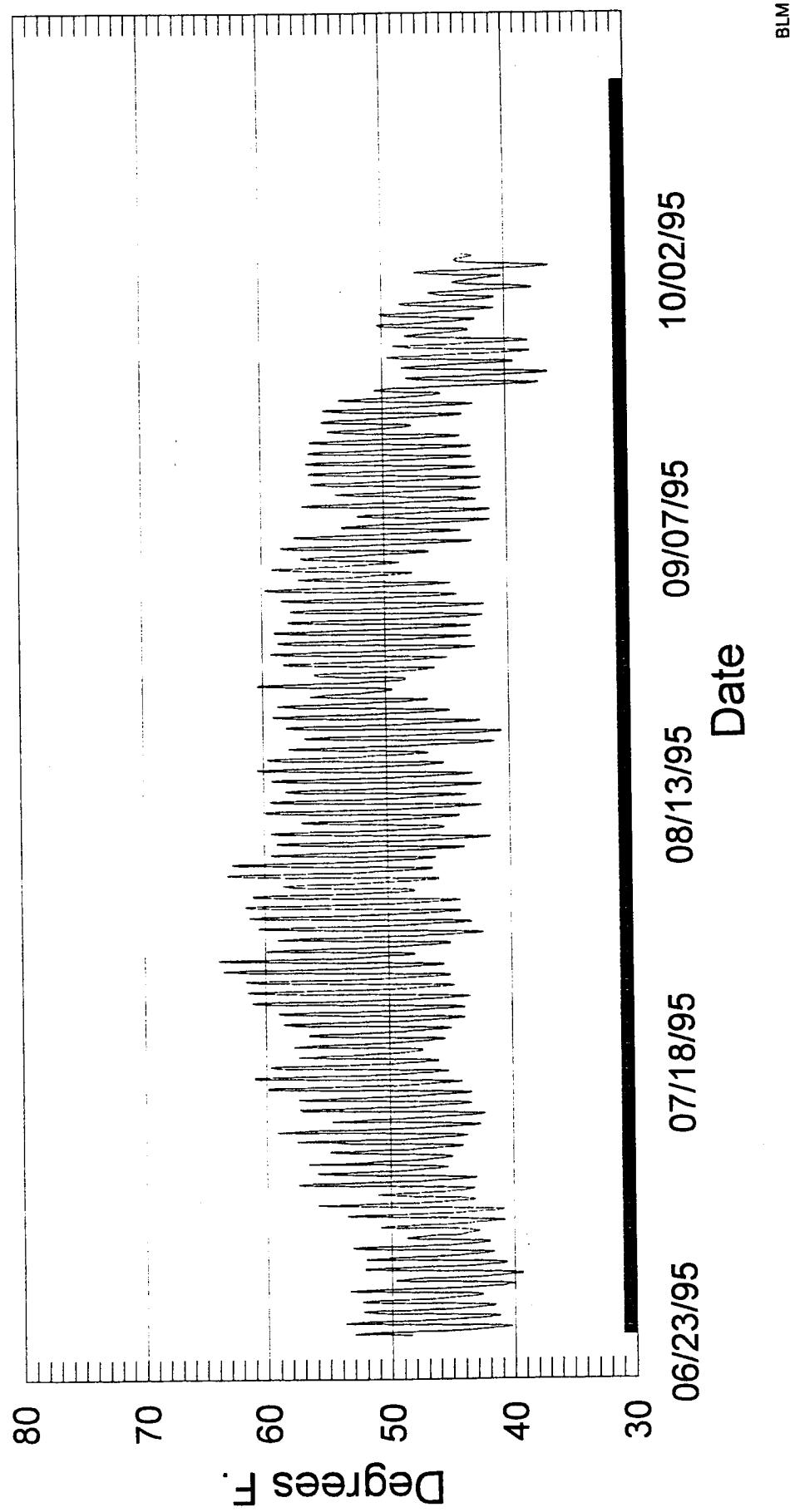


Thompson Creek  
1995 HOBO Temperatures

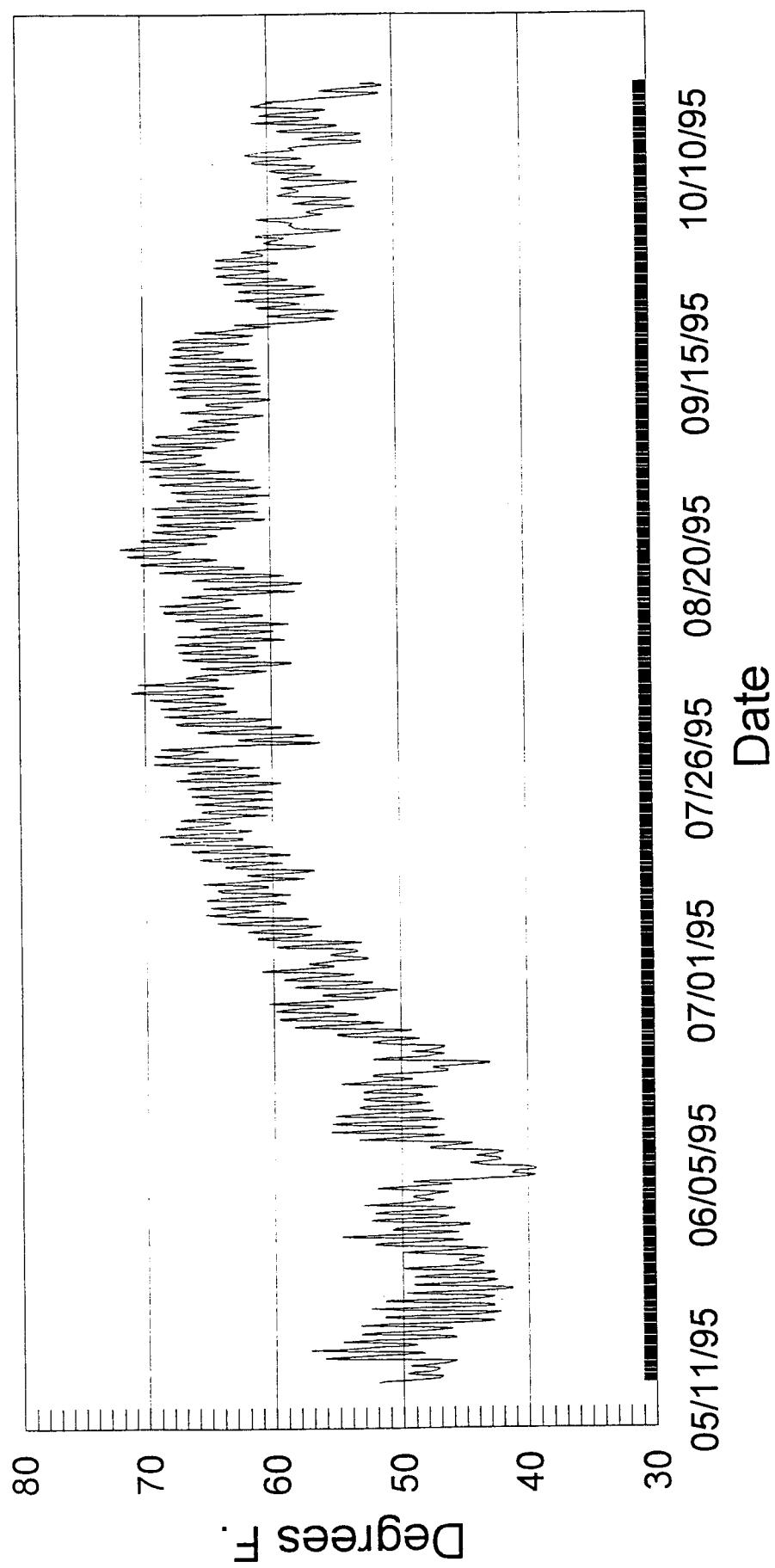


USFS

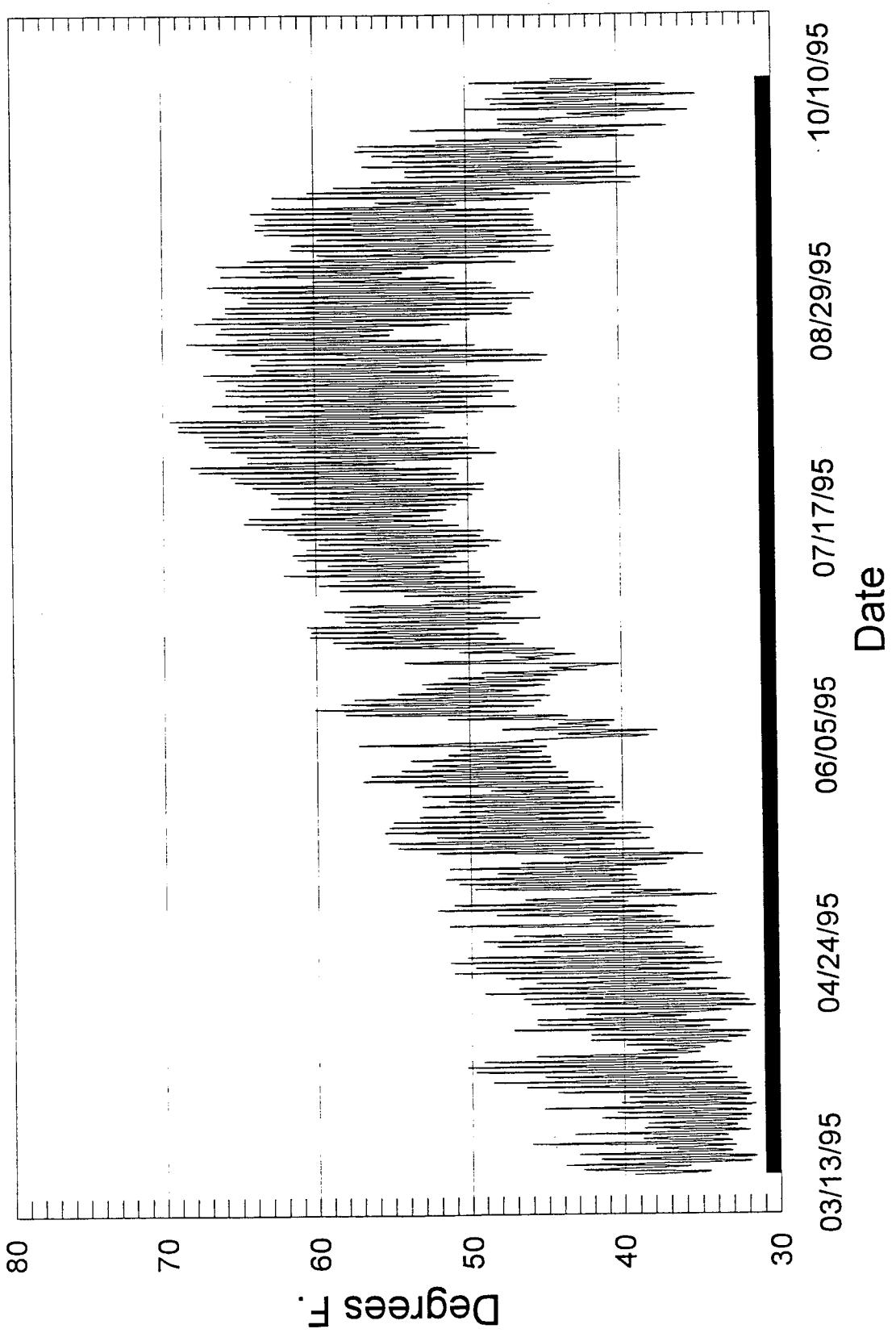
**Thompson Creek**  
**1995 HOBO Temperatures**



**Warm Spring Creek above Mouth  
1995 HOBO Temperatures**

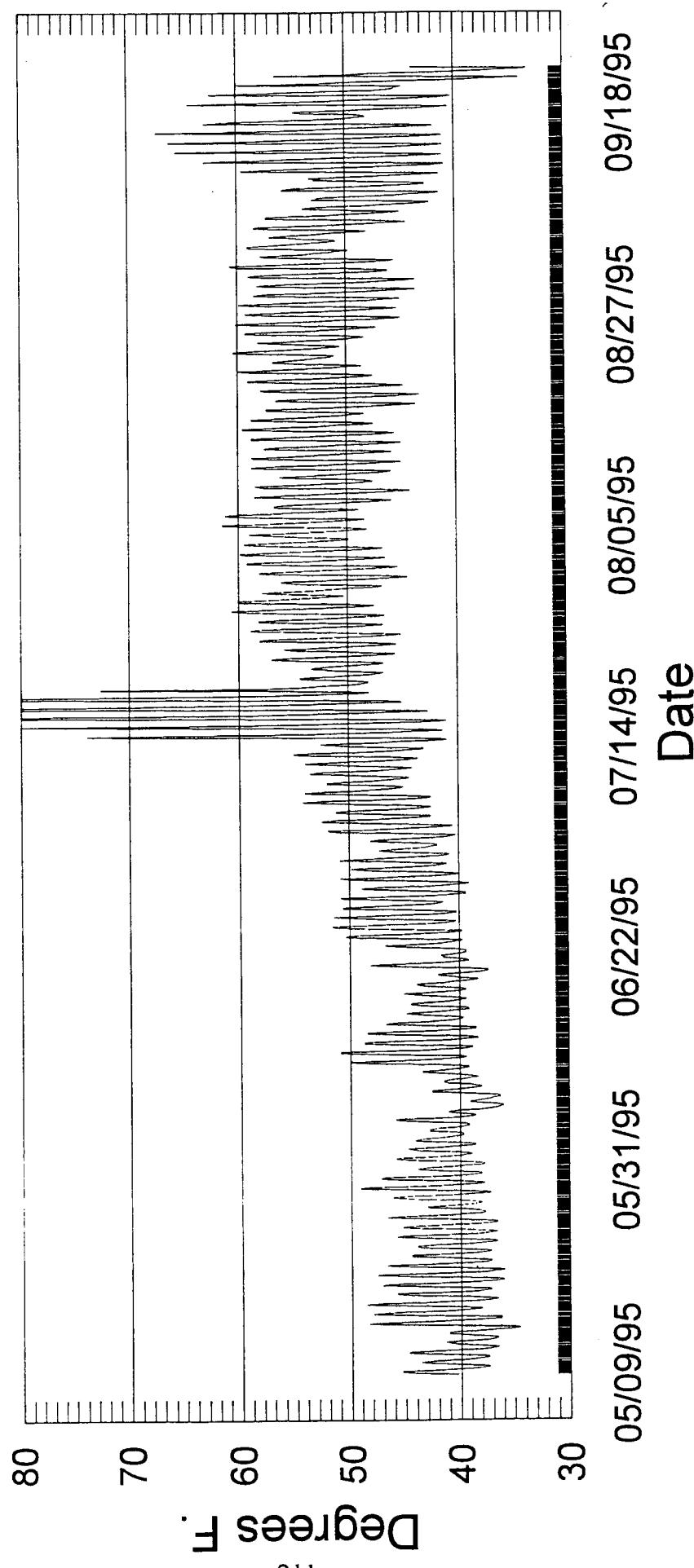


**Valley Creek at Mouth above USGS Gauge  
1995 HOBO Temperatures**



ShoBan

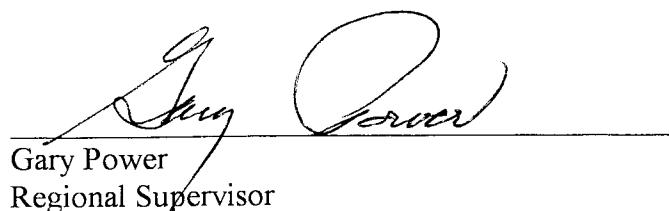
# Yankee Fork Salmon River near Pole Creek Cpgd. 1995 HOBO Temperatures



USFS

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Approved by:

  
\_\_\_\_\_  
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Regional Supervisor

Date May 14/77

